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1980 AGRICULTURAL OUTLOOK

Papers Presented at the Agricultural Outlook Conference
Sponsored by the U.S. Department of Agriculture—
Held in Washington, D.C., November 5-8, 1979

PREPARED FOR THE
COMMITTEE ON AGRICULTURE, NUTRITION,
AND FORESTRY
UNITED STATES SENATE

DECEMBER 23, 1979



Printed for the use of the
Committee on Agriculture, Nutrition, and Forestry

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(II)

FOREWORD

The 1980 Agricultural Outlook Conference, under the theme of "Agriculture in a World Setting," brought together experts from every facet of the American agricultural system—producers, processors, traders, Government planners, and consumers—to discuss current issues and problems and to examine prospects for the coming year and the new decade.

This year's conference, sponsored by the U.S. Department of Agriculture, paid special attention to the continuing problems of inflation and energy as they pertain to the food and fiber sector. Energy from agriculture, which took on increased significance in 1979 as "gasohol" captured national attention, was the subject of a special session.

Transportation of food and fiber products—a crucial issue in these times of rapidly expanding U.S. agricultural exports—also received thorough examination.

In response to Agriculture Secretary Bergland's call for a national dialog on the future of American agriculture, the conferees devoted a session to issues of "farm structure."

As in the past, individual sessions highlighted the outlook for livestock and poultry and all major U.S. crops. Sessions on family living focused on nutrition, including implications of a nationwide food consumption survey, and ways that families can cope with inflation and changing economic conditions.

To provide members of the Senate Committee on Agriculture, Nutrition, and Forestry, the Senate, and the general public with timely and useful information on America's agriculture, the material presented at the 1980 Agricultural Outlook Conference is being published as a committee print.

The views and conclusions presented in this publication are those of the authors and do not necessarily represent the opinions of the committee or U.S. Department of Agriculture.

HERMAN E. TALMADGE,
Chairman.

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CONFERENCE OPENING

(By James H. Williams, Deputy Secretary, U.S. Department of Agriculture)

On behalf of Secretary Bergland and every person in the Department whose work concerns the future of American agriculture, I welcome you to the 56th Annual Agricultural Outlook Conference.

We are standing today at the brink of a new decade, and in a short 20 years we will embark on man's third millennium since the birth of Christ. How well we survive up to and into this third thousand years depends in large part on how we respond to the challenges put forth by this year's conference theme, "Agriculture in a World Setting." Agriculture is a primary and vital steppingstone in a chain of intercommunication, intercooperation, and interdependence which must be effective if the quality of life is to improve for some, and remain adequate for others—all citizens of the planet Earth.

Looking back for a moment, in 1923 when the first Outlook Conference was convened, the main purpose was to provide a way to get economic research findings out to the American farmer. The Conference aimed not to formulate an agricultural program, but to draw a picture of conditions with respect to the probable supply and demand throughout the competing area. The farmers were not to be told what to do, but given the facts to help them act intelligently.

Thus the purpose of Outlook 1980 parallels that of Outlook 1924. But the character of these forums has improved with age since the first conference with its locked doors and limited invitations.

For years the conferences have been open to anyone with an interest in the course of American agriculture from the United States and from abroad, the atmosphere of secrecy of 56 years ago having been discarded long ago and our theme of a world setting is borne out by the many countries represented here today. Thank you for joining us. We look forward to hearing your comments over the course of this conference.

Throughout this week, we will frequently look to the past decade for history as we set our sights toward the 1980's. And with good reason. Agriculture has undergone dramatic changes in the 1970's. Ten years ago we could not have anticipated the magnitude of growth in agricultural trade or foreseen the proportions of the U.S. role in that trade.

The statistics are interesting and awesome at times: World consumption of grain has increased 30 percent during the 1970's, and world oilseed use has risen 60 percent. Production and trade have expanded extraordinarily to meet the increased demand. World output of grains has risen 27 percent in the 1970's, and oilseed output, 77 percent.

But the numbers that best underscore the growing interdependence in the agricultural world are these: World trade in grains has increased

81 percent since 1969-70, world oilseed trade by 83 percent, and world cotton trade by 126 percent. The United States has capitalized on this phenomenal growth in global agricultural markets and has reinforced its role as the world's major food supplier. The volume of U.S. exports of grains and oilseeds has nearly tripled during the 1970's and the value of all U.S. agricultural exports has nearly quintupled.

Interdependencies were created which will be carried into the next decade, and most likely into the next century as well—the world became more dependent upon U.S. agriculture; U.S. agriculture, in turn, became more dependent on foreign markets; and the U.S. economy became more dependent on its agricultural sector as a source of income and foreign exchange as well as a steady supply of food.

Some of the consequences for the U.S. economy have been enormous. Net farm income rose by two-thirds in 1 year—1973—but was a third lower 4 years later. Agricultural exports in this decade became critical toward offsetting the balance-of-payments deficits for petroleum imports, and U.S. retail food prices have doubled. Of this rise, however, farm value accounted for only 30 percent, while marketing margins, which include processing, packaging, and transportation, accounted for 50 percent.

Consumers, urban and rural, look to the changing economy and to the agricultural sector for clues about the most basic necessity of life—food and its costs. We are committed to these consumers—farmer and city dweller alike—to ensure nutritious food in steady supply, and to upgrading and maintaining a high quality of life for these different sectors of America's populace.

Through both the economic and family living sessions of this conference we will examine wide-ranging issues. We will see how trade and farm income indeed have implications on the quality of life for all Americans who care about supplies, prices, quality, safety: rural and urban consumers who are affected by transportation and energy and similar concerns as we enter the 1980's, and thus the circle of interdependencies becomes complete and extends from the world agricultural market to the concerned U.S. consumer.

We face major problems and we undoubtedly are going to discover some wonderful solutions working together in the 1980's. We are hard hit by the effects of inflation and energy problems of the farming sector and the public at large. This conference will review these issues plus the structure of agriculture, our trade with foreign buyers, and the ability of our transportation system to handle our growing exports. There is much to give us pause and this is why we are together for the 56th Annual Agricultural Outlook Conference.

Again, my warm welcome, and along with it, my hope that at this conference dialogs may begin which could herald the solutions to some of our most pressing agricultural and economic problems.

GENERAL OUTLOOK

245 WORLD AND U.S. ECONOMIC OUTLOOK

(By Lyle E. Gramley, Member, Council of Economic Advisers)

My task today is to help set the stage for your general review of the agricultural outlook by discussing the prospects for U.S. economic growth. Let me state at the outset that you should not expect to hear a specific quantitative forecast. The administration's official economic forecast for 1979 and 1980 is still the one published with the Mid-Session Budget Review in July, and we will not release new numbers until this coming January. What I will try to do, however, is give you qualitative judgments on how our economy is likely to perform between now and the end of 1980.

Let me begin with a brief review of some of the more salient developments of this year that I believe will shape the course of the economy over the year ahead.

At the beginning of 1979, economic growth was expected to slow considerably from the rapid pace of the past several years. Supplies of resources available for expanding production had gradually dwindled during the course of the economic expansion that began in 1975. Moreover, fiscal and monetary policies had shifted toward restraint in an effort to contain inflationary pressures, inevitably, such policies tend to limit the rise in output and employment.

Growth in the economy this year, however, has slowed much more than originally anticipated. Developments on the price front have been even more disappointing. The rise of prices has not moderated as we had hoped; on the contrary, the rate of consumer price increase—as measured by the CPI—has accelerated substantially, to an annual rate of 13 percent.

A substantial part of this acceleration has stemmed from an explosion of energy prices, which rose at a 46 percent annual rate in the first 9 months of 1979. Costs of home purchase and finance have also risen sharply—at 19 percent annual rate—and food prices have climbed at a rate of 10 percent. Prices of all other consumer goods and services have risen at a 7 percent annual rate, the same as in 1978.

These widely publicized rates of increase in the CPI overstate somewhat the effects of inflation on consumer purchasing power, in large part because of the way the CPI treats the costs of home purchase and financing. The price deflator for personal consumption expenditures—which measures the costs of using the services of a house, rather than the costs of acquisition—is, I believe, a better measure of the inflation problem faced by the average consumer. That measure of consumer price inflation rose at an 11 percent rate over the first 3 quarters. However, that still an inflation rate far above the 9½ percent annual rate of increase in average hourly earnings in the private

nonfarm economy. Real wages have been severely squeezed, and with inflation also eroding the real value of financial assets, consumers have been forced to curtail their spending in real terms. That is the main reason why economic growth has slowed so much this year.

The effect of energy price increases in reducing consumer purchasing power this year has been very large. During the first three quarters, consumers spent 8 percent of their after-tax income, or \$129 billion at annual rates, directly on energy. Since energy prices in the deflator for consumption expenditures have risen about 34 percentage points faster, at an annual rate, than all other prices, the excess rise of energy prices relative to other prices is equivalent to an individual tax increase of about \$40 billion. This is a measure of the direct tax effect resulting from the rise in prices of energy items that consumers buy. But since the energy price explosion also causes prices of other items produced by energy to rise, the overall energy tax on consumers is still larger. It is small wonder, then, that real consumer buying has been comparatively sluggish during 1979.

Consumer expenditures were extremely weak in the second quarter, when the effect of the energy tax on spending was compounded by long gas lines. Unwanted inventories began to pile up on the shelves of manufacturers and trade firms, and production adjustments got underway to bring inventories into better balance with sales.

The forecasting community generally came to the view that a recession was underway. Since then, however, the economy has held up much better than almost anyone had expected. Consumer spending has rebounded; housing starts have remained on a high plateau; employment has continued to rise and unemployment has remained relatively steady; even the index of leading indicators has turned up again.

This resilience of the economy—the apparent ability to ward off recessionary forces—is worth further comment because of its potential implications for how the economy will behave next year. It stems, I believe, from the same three sources that have made the economy seemingly impervious to the recessionary tendencies that forecasting economists have been seeing on the horizon since the middle of 1978 and in some cases much earlier.

First, the expansion since 1975 has been notably free of cyclical imbalances. Cautious inventory policies have kept stocks in reasonably good balance with sales; overbuilding of shopping centers, apartments, and office buildings has also been avoided. Second, consumer spending has been more strongly supported by a combination of demographic factors, ready availability of credit, and inflationary expectations than in earlier recoveries. Yet, there is little evidence that consumer balance sheets have become seriously distorted. Consumer real net wealth is still rising, and delinquency rates on mortgages and consumer installment loans have remained relatively low. Third, application of the monetary brakes—at least until the recent Federal Reserve actions, to which I will return subsequently—have not resulted in the marked changes in credit availability that use to be instrumental in toppling the economy into recession. Monetary policy has been working primarily through changes in the cost of credit, rather than its availability, and the effects on real economic activity have been less abrupt than they once were.

We used to think, based on historical experience, that an economy ended a long period of expansion ripe for a cyclical downturn. That may no longer be the case. Forces that bring an end to expansion may now simply result in very slow growth or a minor decline, rather than a classic recession.

Recent signs of resilience in the economy do not mean, however, that we are out of the woods. Realistically, economic growth next year is likely, at best, to proceed at a very slow pace—slower than the 2 percent the administration estimated in the mid-session budget review—so that unemployment will increase next year. The rise of consumer real incomes and spending will be impeded by a heavy “oil tax” and by rising marginal personal income tax rates caused by inflation. We cannot expect consumers to sustain high spending rates in the face of slow growth in real incomes, because the personal saving rate is already at a very low level. Business capital spending will be adversely affected by this outlook for consumer spending. Indeed, signs have already appeared that businesses have begun to trim their plans for capital investment. Orders for capital goods, in real terms, rose sharply late last year and on into early 1979, but they have since declined; contract awards for commercial and industrial buildings have also fallen. The recent McGraw-Hill survey of business investment plans also suggests little or no growth in real capital spending next year. Moreover, in light of recent increases in interest rates, housing starts will probably decline early next year before turning up again.

With respect to the time profile of changes in economic activity, forecasters widely expect a weak first half of 1980, with declines in real GNP, followed by a pickup thereafter. There is disagreement, however, as to the steepness of the decline and subsequent recovery. My judgment is that we are likely to see only a mild recession and a moderate pace of recovery, because I think the factors that have prevented the current period of weakness from evolving into a classic cyclical decline are likely to continue. Many private forecasters, however, foresee a more typical V-shaped recession and recovery, and this view has become much more common since October 6.

On that date, the Federal Reserve announced a series of policy actions designed to help dampen inflationary pressures. The discount rate was raised; an 8-percent marginal reserve requirement was established for funds purchased by commercial banks, and the day-to-day operating strategy of the Federal Reserve was changed from focusing on interest rates to focusing on growth of bank reserves.

Of these three actions, the shift in operating strategy is potentially of greatest importance to the performance of the economy. Interest rates have risen significantly since October 6. Short term interest rates have increased $1\frac{1}{2}$ to 2 percentage points; corporate bond rates have risen about 1 percentage point, and mortgage interest rates (as far as one can judge from anecdotal evidence) have gone up about $1\frac{1}{2}$ to 2 percentage points.

The speed with which interest rates have risen under the new operating strategy has created a good deal of uncertainty among lenders, particularly in the mortgage market. New mortgage loan commitments have apparently dropped off rather sharply, and potential homebuyers are finding credit more difficult to obtain, as well as facing

sharply higher costs. Usury laws have suddenly begun to constrain mortgage credit flows in a number of States.

If these conditions in the mortgage market were to prevail for several more months, there would obviously be the potential for a sharp decline in housing starts early next year, and that would increase the chances of a fairly sharp decline in overall economic activity. On the basis of what has happened to date, however a conclusion that a sharp decline is inevitable would be unwarranted. Market interest rates have leveled out in the past week and the clouds of uncertainty that earlier had prevailed in financial markets have begun to disperse. Moreover, it is by no means clear how long the current higher level of interest rates will prevail. If growth in the principal monetary aggregates during 1980 were the same under the new Federal Reserve operating strategy as would have obtained under the old, then interest rates on average next year would be no higher. The change in strategy would therefore have little or no significance for real economic growth. Such an outcome is by no means implausible. Indeed, as Chairman Volcker has stated this new operating strategy may provide more freedom for the Federal Reserve to let interest rates come down when credit demands weaken, since a decline in rates stemming from market forces would not be interpreted as a backing away by the Federal Reserve from its commitment to fight inflation.

I do not think we can be at all sure how this new operating strategy will evolve. It has increased the uncertainties surrounding any forecast of real economic activity for next year, and it has also added to the downside risks. But it has increased the likelihood that we will make progress next year against inflation, and that is clearly a plus. Until we know more about how financial markets and the real economy will react to the shift in operating strategy, however, we are not in a position to assess quantitatively the effects on real output, employment, or prices.

On the inflation front, we expect to see a moderation in the overall rate of price advance during 1980. Weakness of the economy will lead to reductions in some raw materials prices, and to a squeeze on profit margins, as more resistance to price increases develops. Energy prices will almost certainly continue to rise faster than other prices. But barring another gigantic OPEC price increase, or significant reductions in world oil output, energy prices next year are likely to rise less rapidly than in 1979. With any luck, the overall inflation rate will drop below the double-digit range in 1980. Recent increases in mortgage interest rates, however, will keep the CPI rising at uncomfortably high rates in the months immediately ahead.

The progress against inflation we hope for next year might not be achieved, however, if past increases in prices were to spill over into wage increases. The squeeze on real wages of American workers this year has been severe. Naturally, workers want to make up for the loss of real income and will seek to do so by pressing for larger wage increases. Such an effort, however understandable, would be self-defeating. Costs would simply rise faster, and so would prices. The underlying inflation rate would then worsen, and it would take many years to bring it back down again.

The potential for spillover of this year's rise in energy and other prices into next year's wages is a very serious concern for economic

policy. Avoiding it requires not only the discipline of market forces, but also an effective program of standards for private price and wage behavior.

The most important change in the administration of the standards for the second program year was the appointment of a tripartite Pay Advisory Committee consisting of representatives of labor, business, and the public to provide greater public participation in the program and to advise the Council on Wage and Price Stability. The principal motivation for this step was the realization that the potential for a spillover of rising prices into wages and costs—and hence into future inflation—was very great. Furthermore, the fact that workers with adequate cost-of-living protection in labor contracts had fared better than others has created divergencies in wage rates that could lead to a sharp increase in nominal wages. Greater participation by labor, management, and the public in administering the standards appear to be our Nation's best hope for avoiding a struggle among competing economic groups, each aiming to achieve a larger slice of a shrinking economic pie.

The Pay Committee has just begun its work. What the outcome of its deliberations will be no one can be sure. I am confident, however, that members of the Pay Committee recognize fully the national interest in preventing a wage explosion, and that they will search diligently for ways to ensure that the costs of fighting inflation are shared equitably.

The task we face to regain price stability is a formidable one. We must be prepared to preserve for as long as it takes to accomplish that objective. Prudent fiscal and monetary policies are an essential weapon in the struggle with inflation; so also are policies to contain, and ultimately roll back, the momentum of inflation that has become imbedded in private price and wage changes. But our longrun fight against inflation will be more successful if we improve productivity growth through incentives to business capital investment, hold down the costs of environmental and safety regulations, and increase competition through regulatory reform. And we must persist in efforts to increase our energy independence, and thereby reduce exposure to the shattering effects on prices and the real economy of large OPEC oil price increases.

CONCLUDING REMARKS

Our Nation's economy is encountering problems that are testing our national will. We face a very difficult period ahead. I am convinced, however, that the American people are prepared to do what is necessary to deal effectively with inflation.

It is the administration's firm intention to stick to a course of economic policy that is our best hope for bringing inflation down. We recognize fully that modification of our economic policies may at some point be needed to deal with the heavy drain of consumer purchasing power imposed by increasing energy prices and rising effective tax rates, and the impact that has on economic growth and unemployment.

We also know, however, that an abrupt change in economic policy when economic conditions are still highly uncertain, and when inflation has shown no abatement, could destroy our chances for making progress against inflation. We do not intend to let that happen.

THE INFLATION OUTLOOK FOR 1980 AND BEYOND

(By Joel Popkin, President, Joel Popkin and Company)

At the end of 1979, the rate of inflation in the United States will have averaged about 6.9 percent per year since the end of 1967. The thesis of this talk is that during the decade of the eighties the average will be 2 percentage points higher. The reason is that inflation in the United States seems to have an ever increasing floor. That floor is caused by the lack of downward flexibility in wage rate changes in response to slack in the economy and in labor markets.

Tables 1 and 2 demonstrate this point. Table 1 contains annual rates of change and average hourly earnings in manufacturing for nine industrial countries for which such data were available from 1960 to 1978. For this analysis it would have been preferable to use a wage measure that reflects straight-time wages better than average hourly earnings which reflect cyclical swings in premium pay for overtime and the mix of employment between high and low wage industries. But such data are not available on an international basis, so a measure of average earnings is used to approximate wages. It would also have been better to select a broader wage measure than one which pertained only to manufacturing. But that was not possible on an extensive international basis either.

For each country several summary statistics are calculated and appear at the bottom of the table. One is the mean, or the average, rate of change during the 19-year period. Another is the average absolute year-to-year change in the rate of change in wages. This measure shows the extent to which percentage wage increases have fluctuated from year to year. A third statistic is the ratio of the latter mean to the former mean. It measures wage-rate-change flexibility, the observed degree to which wage rate changes can be expected to accelerate or decelerate in the typical year relative to the typical speed at which they are rising generally. This ratio is termed wage flexibility. Wage flexibility in the United States is the lowest relative to that of other countries in the table. It is about one-half the average for the eight other countries.

The same calculations for the same countries and years were made for prices and appear in table 2. Price flexibility in the United States is not lower than that of the other eight countries. In fact, it is somewhat greater than their average. Given its very low wage flexibility, and average price flexibility, the flexibility of prices with respect to that of wages in the United States is the highest of any of these countries—the ratio of price flexibility to wage flexibility is found in the last row of table 2.

Why, then, are wages in the United States less flexible than those in most other major industrial countries? The answer lies in the fact

that wage bargaining is more decentralized in the United States than in other countries and is staggered over time reflecting the fact that many important labor contracts run for overlapping 3 year periods. Countries displaying the highest degree of wage flexibility are those in which a few labor leaders bargain for a large part of the labor force and bargaining, for the most part, takes place annually. In such countries, particularly those in which labor is a part of the government, it is possible to reach agreements that provide for rather marked deceleration or acceleration in rate of wage increases from year to year. This is not the case in the United States.

The foregoing is not intended to suggest that the laws of economics are dead—that wage rate increases will not respond to changes in the excess demand for labor. However, it is intended to convey the fact that given the range within which fiscal and monetary policy are used to slow the economy, a range dictated by political forces more than economic policy goals, fiscal and monetary restraint in the United States are incapable of bringing about much downward change in the rate of increase in wages.

Periodically, the U.S. economy experiences an upward shot of inflation, usually caused by some agricultural shortage, or more recently by cartel-determined crude oil price increases. Such shocks do not typically get passed through to wages to the full extent. Real wages do fall when our economy undergoes such price pressures. But part of the shock is passed into wages and results in a slight acceleration in the rate of wage gain.

Also, from time to time disparities emerge in the wage structure. Between 1975 and 1977 union wage increases rose about 2 percentage points a year faster than nonunion wage increases. This disequilibrium could have been corrected by either a slowdown in union wage rates or a speedup in nonunion wage rates. The passage of the minimum wage legislation that went into effect in January 1978 ensured that the non-union would catch up with the union rather than the other way around. This result obviously causes the rate of inflation to edge up.

Nor can incomes policies cut into the rate of wage increase in any significant way. In any given year, in the union sector, wage rate increases contracted for in earlier years—called deferred increases—bring about union wage increases of about 5 or 6 percent. When the automatic adjustments called for in contracts that contain the cost-of-living clauses are added to these, and given the fact that first year settlements generally average higher than the average annual increase during a life of the typical 3 year contract, it is not possible to set a wage guideline which can hold wage increases to a figure below that obtained in the year immediately preceding the implementation of these policies.

Such policies might be able to achieve a reduction in nonunion wages which are usually negotiated annually and not subject to formal escalation. Indeed, this appears to have happened with respect to non-union wages during 1979. At the beginning of the year and before the increase by OPEC of crude oil prices, the 1979 guidelines were used by many employers as a standard for wage rate increases this year. But, as the year wore on and energy prices shot up along with farm prices, employees in the nonunion sector have become increasingly

restive. In September, wage increases in predominantly nonunion industries appear to have accelerated. As a result, it did not appear likely that the same wage guideline set for 1979 could have been established in 1980. Recently, the Council on Wage and Price Stability has raised the guideline by a percentage point and provided even more room for wage increases for those employees whose wage increases were less than the guideline in 1979.

The result is that wage rate increases, running so far in 1979 at a rate of 7.9 percent for straight-time wages, 9 percent for total compensation per hour, are likely to accelerate next year by about a percentage point. If the economy grows next year—we do not have a recession—some of this acceleration will be offset by a rise in productivity. However, the likelihood is that output will be flat next year and so will productivity. This weak economic behavior will deter unit profits from rising which will shave about one-half percentage point from unit labor costs. As a result, we can look for an underlying inflation rate of about $9\frac{1}{2}$ percent next year as measured by the Consumer Price Index excluding food, energy and mortgage interest rates. The GNP deflator will rise by about $9\frac{1}{2}$ percent as well.

Consumer food and energy prices and mortgage interest rates are likely to rise at a faster rate than that of $9\frac{1}{2}$ percent for the rest of the Consumer Price Index. This should produce a 10.5-percent rise in the Consumer Price Index from the fourth quarter of 1979 to the same quarter of 1980.

The flat behavior of unit profits will be rather atypical for a year of no growth in output; unit profit would usually decline under such circumstances. However, in recent years, unit labor cost increases brought about by cyclically deteriorating productivity changes have been passed through increasingly rapidly into prices. In earlier years, producers tended to mark up prices over standard unit labor costs with the result that if shortrun productivity exceeded its trend, profits rose; if it were less than its trend, profits declined. This is no longer the case. Companies react much more rapidly to actual changes in costs in the shortrun and these get reflected quickly into prices. Part of this response, indeed, has been conditioned by experience with past incomes policies and the ever present concern on the part of business that we will again enter a period of mandatory controls.

The $10\frac{1}{2}$ -percent outlook for the CPI for 1980, though less than that for 1979, is above the floor for inflation given current rates of wage increase and their downward inflexibility. That floor can be viewed as $8\frac{1}{2}$ percent, based on increases in straight-time wages of about $8\frac{1}{2}$ percent compensation per hour of 9.8 percent and labor productivity of 1.3 percent. During the course of the next 5 years, if not the decade, it is quite possible that we will encounter years in which the rate of inflation will soar above that floor as it did this year, reaching 12 percent or so on an annual basis. In each year that occurs we can expect wage increases to drift up somewhat, albeit slowly. Depending on the frequency of such double digit years, the underlying floor for inflation of about $8\frac{1}{2}$ percent will gradually drift upward over the next decade.

TABLE 1.—PERCENTAGE CHANGE IN AVERAGE EARNINGS IN MANUFACTURING,
SELECTED INDUSTRIAL COUNTRIES, 1960-77

Year ending 4th quarter	Australia	Canada	France	Germany	Italy	Japan	Norway	United Kingdom	United States
1960.....	4.1	3.4	8.0	9.3	5.0	7.1	2.2	6.6	3.0
1961.....	3.4	3.3	7.7	7.5	4.8	13.8	10.6	4.6	2.9
1962.....	.1	1.6	8.9	8.7	13.7	6.6	5.8	4.3	2.9
1963.....	2.1	4.8	8.2	6.6	13.3	12.7	5.5	2.8	2.8
1964.....	5.3	3.0	6.6	8.6	15.4	10.6	6.9	5.1	2.7
1965.....	2.5	5.9	5.7	6.6	5.5	6.9	8.1	7.1	3.9
1966.....	5.4	5.6	6.0	6.2	3.9	13.6	7.5	5.0	3.8
1967.....	4.5	7.9	5.9	4.1	4.6	13.2	8.3	5.4	4.9
1968.....	9.2	7.3	16.5	5.6	3.3	15.6	10.3	7.4	7.0
1969.....	3.1	8.0	8.1	9.8	10.1	16.5	7.0	5.9	5.4
1970.....	5.3	8.4	10.9	15.2	22.6	18.3	15.2	12.9	4.1
1971.....	14.1	8.7	11.3	7.5	11.8	11.9	9.4	11.2	6.9
1972.....	9.0	8.0	11.5	8.2	13.0	17.6	9.5	16.8	7.4
1973.....	14.3	9.9	15.5	10.2	28.7	26.0	11.0	12.2	7.8
1974.....	35.6	16.5	20.6	12.3	20.6	23.7	21.0	21.9	9.6
1975.....	11.4	12.9	15.9	7.7	23.0	9.6	17.6	29.3	7.3
1976.....	14.1	12.6	14.9	5.8	28.3	13.0	16.5	12.1	8.2
1977.....	14.8	11.2	12.0	7.4	23.6	8.1	8.7	3.7	8.8
(1) Average year to year change.....	8.8	7.7	10.8	8.2	14.0	13.6	10.1	9.7	5.5
(2) Average change of year to year changes without regard to direction.....	5.7	1.7	2.7	2.5	5.4	5.3	3.6	4.5	1.0
(3) Earnings flexibility (2) (1).....	.65	.22	.25	.31	.39	.39	.36	.46	.18

¹ Preliminary, 1st 3 quarters at annual rates.

TABLE 2.—PERCENTAGE CHANGE IN CONSUMER PRICES, SELECTED INDUSTRIAL COUNTRIES, 1960-77

Year ending 4th quarter	Australia	Canada	France	Germany	Italy	Japan	Norway	United Kingdom	United States
1960.....	4.6	0.7	3.5	0.8	1.5	3.2	1.6	1.8	1.3
1961.....	.8	.4	3.7	2.7	2.6	8.2	3.1	4.3	.8
1962.....	.1	1.7	4.2	2.7	5.7	4.5	4.5	2.5	1.3
1963.....	.5	1.7	5.3	3.1	7.6	8.2	1.4	2.2	1.4
1964.....	4.0	1.8	2.4	2.5	5.9	5.1	8.5	4.4	1.1
1965.....	4.0	2.8	2.5	4.0	3.4	6.1	2.6	4.5	1.9
1966.....	2.4	3.9	2.8	2.8	2.1	4.1	3.8	3.8	3.5
1967.....	3.2	3.8	3.3	.7	3.7	5.7	4.9	2.1	2.8
1968.....	2.6	4.2	5.3	3.3	.8	4.5	3.5	5.6	4.7
1969.....	2.9	4.6	5.8	1.9	4.0	5.9	3.4	5.2	5.8
1970.....	4.9	2.1	5.2	4.0	5.3	7.8	12.0	7.7	5.6
1971.....	7.1	4.1	5.8	5.7	4.7	5.4	4.9	9.3	3.5
1972.....	4.5	5.2	6.9	6.2	7.2	4.5	8.3	7.7	3.4
1973.....	13.3	9.1	8.3	7.3	11.6	16.4	7.7	10.3	8.4
1974.....	16.2	11.9	15.0	6.4	24.7	24.6	9.5	18.2	12.1
1975.....	14.0	10.2	9.9	5.6	11.6	8.5	11.6	25.3	7.3
1976.....	14.4	5.9	9.9	3.8	21.1	9.4	8.4	15.0	5.0
1977.....	9.3	9.1	9.2	3.7	15.5	6.2	9.0	13.1	6.7
(1) Average year-to-year change.....	6.0	4.6	6.1	3.7	7.7	7.7	6.0	7.9	4.3
(2) Average change of year-to-year changes without regard to direction.....	2.2	1.5	1.4	1.2	4.1	4.0	3.0	2.9	1.6
(3) Price flexibility (2) ÷ (1).....	.37	.33	.23	.32	.53	.52	.50	.37	.37
(4) Ratio, price flexibility to earnings flexibility.....	.57	1.50	.92	1.03	1.36	1.33	1.39	.80	2.06

U.S. AGRICULTURAL OUTLOOK IN WORLD PERSPECTIVE

(By J. Dawson Ahalt, Chairman, World Food and Agricultural Outlook and Situation Board, U.S. Department of Agriculture)

OVERVIEW

The world is more interdependent today than it ever has been. Few sectors of our economy demonstrate this relationship more clearly than agriculture. That interdependence, and the U.S. role in it, will continue to grow in 1980 and the years that follow.

Agriculture in the 1970's

Despite the economic turmoil of the 1970's, the world made considerable progress in upgrading diets during the decade. Consumption of grains advanced at an average rate of $2\frac{1}{2}$ percent per year, compared with an average annual gain of more than 3 percent during the more stable 1960's. Consumption of oilseeds during the current decade accelerated to nearly a $6\frac{1}{2}$ -percent annual rate, mainly in response to increased worldwide demand for meat, milk, and eggs.

This improvement in global diets demonstrates the close interrelationships of world agriculture. In fact, without sharp increases in the trade of agricultural commodities, gains in world consumption could not have occurred. The future points to the continued increases in world agricultural trade that will enable mankind to eat better.

During the 1970's, the volume of world grain and oilseed trade nearly doubled—an annual growth rate of around 6 percent. The U.S. share of global grain exports climbed from 35 percent to nearly 60 percent during that time, while the Soviet Union became a leading importer. The United States maintained its share of world oilseed trade at about 55 percent during the 1970's, while Brazil and Argentina tripled their shares.

Clearly the world agricultural setting is far different now, at the outset of the 1980's, than it was a decade ago. Then, a counterpart of mine stood here to predict U.S. agricultural exports that might for the first time exceed \$6 billion in 1969-70. He also forecast a farm income level of \$16 billion and a "substantial" food price increase of 3.5-4 percent, compared with the "sharp" 5-percent increase of 1969. How different the world seemed then.

Before moving to the outlook for U.S. and world agriculture for 1980, it might be useful to contrast the agriculture of the 1970's with that of the 1960's. Papers that will be delivered tomorrow, by Howard Hjort, Turner Oyloe, and others will look ahead to the policy and trade issues we might anticipate further along in the 1980's.

After hovering close to loan-rate levels in much of the 1960's, grain prices rose sharply in the early 1970's as global supplies tightened. During the 1960's, there had been no major year-to-year drop in global

grain production. However, from 1972-73 to 1979-80, world grain output has fallen four times. Soviet grain production became more erratic in the 1970's as additional area came under cultivation. The Soviets' net grain trade shifted from net exports of 6 million tons in 1970-71 to net imports of 25 million tons in the poor crop year of 1975-76. Soviet grain imports are projected at 32 million tons in 1979-80.

While rising grain prices in the 1970's caused a cutback in livestock feeding in the United States, and Soviet grain consumption was limited in poor crop years by import capacity, the rest of the world continued to consume grain at unprecedented levels. For the world excluding the United States and the U.S.S.R., there were no year-to-year declines in grain usage from 1969-70 to 1979-80. This strong world demand pulled food grain stocks to unusually low levels in the midseventies. By 1975-76, grain stocks had fallen to about 135 million tons, down from 207 million at the beginning of 1970-71. The ratio of stocks to use—a key price determining factor—dropped to nearly 10 percent during this period compared with 16 percent in the late 1960's.

Although other farm commodity prices rose sharply during this period, the boost to producer returns was short lived. The U.S. livestock sector earned higher returns in early 1973, but domestic price controls, rising oil prices, and a slowdown in economic activity in a number of the high-income market economies soon brought herd liquidation and depressed livestock prices. As output expanded in response to the runup in prices in the midseventies world agricultural commodity prices dropped to a low in 1977. By 1978 and early 1979, changes in agricultural policies in the United States and a recovery of world economic activity had strengthened farm product prices, with grain prices again on the upswing.

The effects of these supply and price fluctuations on the U.S. economy, within and outside the agricultural sphere, are well known:

Yearly increases in U.S. retail food prices had averaged 2.5 percent during the 1960's. During the 1970's increases averaged 8 percent per year, including 14 percent jumps in 1972 and 1974.

U.S. net farm income rose from \$17.8 billion in 1972 to nearly \$30 billion in 1973; dropped to \$21 billion in 1974 and remained at that level, or lower, for 2 more years; then recovered in 1978 and 1979.

U.S. agricultural exports hit continuous records. The agricultural trade surplus has risen from \$1.5 billion in 1970 to \$16.6 billion in 1979, while the nonagricultural trade balance dropped from a surplus of \$1.3 billion to a deficit of \$40 billion.

THE GLOBAL ECONOMIC SETTING

Rising population and income and efforts to upgrade diets are the factors behind the growth in world demand for food. Despite slowed economic growth in the high-income market economies in the mid-seventies, steady and rapid gains in the high-income developing nations (especially the Middle East and East Asia) and in the centrally planned countries have been major forces determining worldwide grain, oilseed, and animal-protein demand.

As we look toward 1980, uncertainty abounds again in the market economies of the high-income countries. The OPEC price increases of 1979, coupled with persistent inflation, now appear to be turning economic output down in the United States. Although business activity

has been stronger than earlier expected up to this point, recent Government actions to slow monetary growth are expected to bring a pause. The extent of the decline is difficult to predict.

These developments should help wring some of the inflation out of the economy in the year ahead. It now seems possible that real growth could drop significantly and lead to a situation much weaker than the "soft landing" predicted by a number of economists earlier this year.

While the United States is likely to be in a "recognized" recession by the fourth quarter of 1979 or early next year, the outlook for Canada, Western Europe, and Japan points to a noticeable slowdown running some 6 months behind the United States. Although the recent oil price increases and general signs of tightening point to a slowdown in much of the Western World, the decline in economic activity is not likely to be as sharp as the 1974-75 recession.

ESTIMATED ECONOMIC INDICATORS

[Selected countries/regions]

Country/area	Change in gross national product		Change in Consumer Price Index	
	1978	1979 forecast	1978	1979 forecast
United States.....	4.4	2.0	7.7	10.9
U.S.S.R.....	4.0	3.0	(¹)	(¹)
East Europe.....	5.5	6.0	(¹)	(¹)
EC-9.....	3.0	3.0	7.1	9.0
Japan.....	5.5	5.8	4.3	5.1
Canada.....	3.4	3.5	8.9	9.4
Australia.....	3.7	3.5	7.9	9.0
Brazil.....	6.3	5.0	41.0	50.0
Argentina.....	-4.1	4.0	170.0	150.0
India.....	3.9	4.5	7.5	9.0
LDC's:				
Asia.....	6.4	6.5	8.3	9.2
Africa.....	3.2	4.5	9.0	10.5
Latin America.....	4.6	5.4	(¹)	(¹)
OPEC.....	4.2	4.8	17.0	16.0
OECD.....	3.5	3.0	7.0	(¹)

¹ Not available.

Economic growth is expected to continue, though at a somewhat moderated pace, in the centrally planned economies and the rapid-growth emerging nations, including those dependent on high-priced oil imports. Despite problems with inflation and high oil prices, a number of the food-importing nations have relatively good financial reserves to help them maintain diets.

On balance, the global economic picture indicates the demand for food will expand in the year ahead—at a pace less than that of the past 2 years but more rapid than the 1974-75 period. Requirements for feed grains and oilseeds should remain fairly strong, as the demand for meat, milk, and eggs continues to grow.

Inflation

With prospects for slower growth in the United States and most of the rest of the world, some progress should be made in slowing the rate of inflation. However, any progress is likely to be mainly in the eyes of the experts. Countries dependent on imported petroleum will continue to face severe cost pressure from OPEC increases and the strong overall rate of inflation that accompanies these increases. After reach-

ing an annual rate of increase in excess of 13 percent during the second and third quarters of 1979, the Consumer Price Index (CPI) is expected to slow to a rate of around 11 percent in the final quarter of this year.

If the slowing in economic activity occurs as anticipated, increases in the CPI should decelerate in 1980. By late in the year, increases could drop below the double-digit rate. Thus, the increase for the year should be below the 11 percent of 1979.

As inflation has continued, real after-tax incomes have been declining since the second quarter of this year. That pattern is expected to continue at least through the first half of 1980 before any major recovery is likely in consumer real buying power.

Inflation, of course, hurts farmers as well as consumers. U.S. farmers purchase roughly 70 percent of their production inputs from the nonfarm economy. During October, the index of prices paid by farmers was up 14 percent from the same month a year earlier,

WORLD COMMODITY OUTLOOK

Prospects for 1980 and the following couple of years point to continued growth in world food and fiber demand. Production, too, will continue to grow, though the rate of increase appears to be diminishing.

The rate of increase in global grain production dropped from 3.2 percent per year in the 1960's to 2.9 percent in the 1970's—and most of that gain has become absorbed by population growth. The main reason for the decline is lagging productivity. While the growth in harvested area rose slightly during the 1970's the rate of improvement in yields dropped from 3 percent per year to 1.8 percent.

WORLD SUPPLY AND UTILIZATION: GRAINS, OILSEEDS, COTTON

Item	1970/71	1975/76	1976/77	1977/78	1978/79 ¹	1979/80 ²
Million metric tons						
Total grains:³						
Beginning stocks.....	205	133	138	194	191	226
Production.....	1,100	1,238	1,354	1,336	1,448	1,382
Total supply.....	1,305	1,371	1,492	1,530	1,629	1,608
Utilization.....	1,139	1,233	1,298	1,339	1,413	1,419
Ending stocks.....	166	138	194	191	226	189
Stocks as a percent of use.....	(15)	(11)	(15)	(14)	(16)	(13)
World trade.....	109	151	156	166	173	191
Oilseeds:⁴						
Beginning stocks.....	6.7	7.5	8.6	6.6	6.9	7.4
Production.....	56.2	75.9	67.4	79.7	85.2	196.5
Total supply.....	62.9	81.4	76.0	86.3	92.1	103.9
Utilization.....	59.6	72.8	69.4	79.4	84.7	91.1
Ending stocks.....	3.3	8.6	6.6	6.9	7.4	12.8
Stocks as a percent of use.....	(5.5)	(11.8)	(9.5)	(8.7)	(8.7)	(14.1)
World trade.....	24.7	32.5	33.6	38.8	41.2	44.7
Million 480-lb. bales						
Cotton:						
Beginning stocks.....	22.2	30.9	24.0	20.7	24.0	21.6
Production.....	53.7	54.0	57.4	63.9	59.8	63.8
Total supply.....	75.9	84.9	81.6	84.6	83.8	85.4
Utilization.....	56.1	61.2	60.9	61.2	62.8	63.1
Ending stocks.....	20.9	24.0	20.7	24.0	21.6	22.6
Stocks as a percent of use.....	(37)	(39)	(34)	(39)	(34)	(36)
World trade.....	17.7	19.1	17.6	19.1	19.5	9.9

¹ Preliminary.

² Projected.

³ Including milled rice.

⁴ Soybean meal equivalent.

⁵ Total supply less the ending stocks of soybeans and soybean meal in the United States, Brazil, and Argentina on Oct. 1.

Grains

We are projecting that 1979-80 world grain production will be about 4½ percent lower than last year's—the largest year-to-year drop on record.

The impact of similar production declines in the past has been harrowing. After a drop of less than 3 percent in 1972-73, world wheat prices more than doubled and feed grain prices rose by over 70 percent. After a production decline of less than 4 percent in 1974-75, global consumption of grain dropped by 2½ percent, the first worldwide consumption decline in over 20 years.

But the setting now is dramatically different from that of a few years ago. We anticipate no cutback in global grain use in 1979-80—in fact, we will probably see a modest increase, with world grain prices rising only slightly. There are a number of closely related reasons:

The 1978-79 world grain harvest was the largest ever. Stocks entering the 1979-80 marketing year were also at an all-time high of 226 million tons, and the stocks-to-use ratio was a comfortable 16 percent—roughly 60 percent above the tighter levels of the midseventies. Record-high consumption will draw stocks to around 190 million tons by the end of this season, but the stocks-to-use ratio will dip only to about 13½ percent.

The world stocks picture is made more secure by the United States grain reserve system. The reserve, most of which is farmer owned, accounted for about 45 percent of the U.S. stocks of 73 million tons at the beginning of 1979-80. The system allows grain supplies to be released to the market or isolated in the reserve depending on price levels. This action serves to modify price fluctuations resulting from savings in supplies.

Large supplies of oilseeds worldwide, somewhat in excess of expected 1979-80 requirements, will depress oilseed prices and dampen increases in grain prices.

Though consumption and trade of grain are expected to be record large next year, both might have been stronger had economic growth not begun to slow in most parts of the world. Although pork and poultry feeding is expanding, growth in U.S. and world grain feeding is limited by the rebuilding phase of the cattle cycle.

We project that world grain trade in 1979-80 will exceed 190 million tons for the first time, with the United States accounting for 110 million tons. The U.S. exports will include records for wheat, at 38 million tons, feed grains, at 71 million tons, and rice, at 2.6 million tons (milled basis).

The strong foreign demand is boosting U.S. farm prices, despite the anticipated record 1979-80 U.S. total grain crop of over 288 million tons. With grain prices strong relative to those for oilseeds, U.S. farmers will probably increase acreage planted to corn in 1980.

U.S. FARM PRICES

Crop	1977/78	1978/79	Forecast 1979/80
Wheat (dollars per bushel).....	2.33	2.94	3.60-3.90
Corn (dollars per bushel).....	2.02	2.20	2.35-2.65
Soybeans (dollars per bushel).....	5.88	6.75	5.75-6.50
Rice (dollars per hundredweight).....	9.49	8.00	8.75-9.75
Cotton (cents per pound).....	52.3	58.8	-----

Oilseeds

Probably the most striking single example of the growth in demand for agricultural products during the seventies is the expansion in consumption of oilseeds and products. Global consumption of oilseeds and meats had risen nearly 60 percent during the seventies—a 4.7 percent annual compound growth rate. This growth mainly reflects increased demand for animal products. Some of the world's sharpest gains in meat consumption have occurred in some Western European countries and Eastern Europe, Japan, the Soviet Union, and parts of Central and Latin America. A number of these countries are major U.S. markets for oilseeds and other feedstuffs.

Through most of the seventies, yearly consumption gains pretty closely matched production increases. The results were minimal build-up of oilseed stocks and generally strong prices. Global production of oilseeds and meals has increased 77 percent since 1969-70; since 1976-77, output is up 43 percent. To distribute that production, world oilseed trade has risen 83 percent during the seventies.

It is important to note that U.S. producers were by no means the only ones to benefit from the increased demand for oilseed products. While United States soybean production has more than doubled during the seventies to more than 60 million tons, Brazilian output has increased fivefold to a forecast 13.5 million tons. Argentine production has evolved from practically none to about 4.5 million tons with considerable potential for more increase. These three countries account for about 80 percent of global soybean production and 98 percent of world trade.

Though world consumption will climb again in 1979-80, it will not match the anticipated 13.2-percent increase in oilseed and meal production. As a result, we expect to see some buildup in stocks and a weakening on oilseed prices—U.S. soybeans may average around \$6.25 per bushel in 1979-80, compared with this past season's \$6.75. With corn prices strong relative to oilseeds, U.S. producers will probably cut back in soybean plantings in 1980.

We also might anticipate some weakening in demand for oilseeds in the latter half of 1979-80, reflecting the slowdown in economic growth and an easing in the expansion of livestock industries in most major countries.

Cotton

World demand for cotton, too, has increased during the seventies, though not at the pace of grains and oilseeds. A gain in consumption of about 13 percent since 1969-70 has been surpassed by production growth of about 18 percent, so stocks have built up slightly. With global cotton stocks consistently around 35-40 percent of use, prices have not fluctuated with nearly the magnitude of grain prices. Aside from production changes, world cotton prices have fluctuated mainly with variation in economic activity and with the degree of competition from manmade fibers.

Global use of synthetic fibers increased much more rapidly than cotton consumption during the seventies, about 81 percent, though cotton has become more competitive in the past several years as rising petroleum costs have driven up synthetic product prices.

In 1979-80 world cotton consumption is expected to be a record-high 63 million bales. Global output should be up 4 million bales from

last year and slightly higher than consumption. Most of the increase in production is occurring in the United States.

The U.S. crop has rebounded sharply from last year's weather damaged harvest to about 14.4 million bales, reflecting record yields. U.S. exports are expected to hit a 19-year high of 6.5 million bales because of relatively low stocks and increasing use in foreign countries, but slower economic growth here should reduce domestic mill use slightly from last year's. As a result, U.S. cotton stocks are increasing sharply this season, placing some downward pressure on prices.

Livestock

The commodity price gyrations of the midseventies caused chaos for the world's livestock producers. Rising grain, oilseed, and energy prices sent production costs soaring, while demand for livestock products weakened with the general economic slowdown that followed the 1974 boom in petroleum prices.

In 1975, the most severe reduction in U.S. cattle herds in history began and selloffs were pronounced in other major producing countries as well. U.S. cattle members continued to decline until 1979, and cattlemen are only beginning to rebuild their herds. U.S. beef production, meanwhile, dropped 18 percent between 1976 and 1979 and probably will not increase again until 1981.

U.S. LIVESTOCK PRODUCTION AND PRICES

	1975	1976	1977	1978	1979	Forecast, 1980
Beef:						
Production (million pounds).....	23.7	25.7	25.0	24.0	21.1	20.5-21.3
Prices (dollars per hundredweight).....	45	39	40	52	68	70-73
Pork:						
Production (million pounds).....	11.6	12.5	13.1	13.2	15.2	16.3-17.0
Prices (dollars per hundredweight).....	48	43	41	48	42	34-37
Broilers:						
Production (million pounds).....	8.0	9.0	9.2	9.9	10.9	10.5-11.0
Price (dollars per hundredweight).....	45	40	41	45	43	40-43
Eggs:						
Production (million dozen).....	5.4	5.4	5.4	5.6	5.7	5.7-5.9
Price (cents per dozen).....	64	70	63	62	68	65-68
Milk:						
Production (billion pounds).....	115	120	123	122	123	122.8-125.2
Price (dollars per hundredweight).....	8.8	9.7	9.7	10.6	12.1	12.8-13.8

Hog and poultry producers were able to capitalize more quickly than the cattlemen on the lower feed costs and expanding demand for meats that followed the chaos of the mid-1970's period. While world production of beef has fallen since 1976, production of pork and poultry in the major producing countries has risen about a fifth. The gains in pork and especially in poultry production have boosted overall world meat production slightly faster than the rate of growth in population.

Annual growth in poultry meat consumption has been particularly staggering in recent years. Double-digit rates of growth have been occurring in the high-income Middle Eastern countries, Brazil, and other rapid-growth Central and Latin America countries. Yearly gains are also rising in the centrally planned economies and in many high-income countries.

With beef supplies low and retail prices high, demand for pork and poultry has been particularly strong. U.S. producers have increased

their pork output 31 percent since 1975, including a 15-percent jump in 1979, and broiler output 38 percent since 1975, with an 11-percent increase this year. As a result of the current overexpansion, pork and poultry producers face a difficult year as the prices they receive drop below rising production costs.

Despite some slowing in demand, cattle prices should continue their gradual recovery from the 1976-77 lows. With beef production down about 12 percent in 1979 and not expected to gain in 1980, steer prices should average above the \$70-per-hundredweight level by the latter half of next year.

IMPLICATIONS FOR U.S. AGRICULTURAL TRADE

The economist who predicted here 10 years ago that U.S. agricultural exports might exceed \$6 billion in 1969-70 was correct. He could hardly have imagined, though, where the United States would go from there. We have wrapped up the 1970's with exports well exceeding \$30 billion, and we now forecast that 1979-80 exports could reach \$38 billion—unless domestic transportation problems overwhelm us.

Through the 1970's the biggest gains have been in shipments of grains, particularly feed grains, and oilseeds, while the nonfood share of agricultural exports has declined. The volume of exports may increase about 16 percent in the coming year. More than half of this is a 12-million-ton increase in feed grain exports.

U.S. AGRICULTURAL TRADE BALANCE

[In billions of dollars]

	1969/70	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	Forecast, 1979/80
Exports.....	6.96	21.61	21.85	22.76	24.00	27.30	31.98	38.0
Imports.....	5.68	10.06	9.47	10.51	13.38	13.89	16.19	17.5
Trade balance.....	1.28	11.55	12.38	12.25	10.62	13.42	15.79	20.5

As it has been throughout the 1970's, the European Community will be the largest market for U.S. agricultural exports in 1979-80 with purchases of about \$7.7 billion. Japan will take about \$5.3 billion, to remain the largest U.S. single-country market. Soviet purchases in 1979-80 should total about \$4 billion, by far their largest ever. Other leading markets are Latin America at \$3.5 billion and Eastern Europe at \$2.2 billion.

It is worth noting that the Soviet Union, even in its peak import years, has yet to surpass Japan in dollar value of imports from the United States. The Soviet situation receives more attention because of the considerable variation in their imports from year to year, while the Japanese market has remained steady.

It also bears mentioning that the United States, in addition to its role as the largest seller of agricultural products, is one of the world's largest buyers of agricultural products. Coffee will again be the largest U.S. import by value, followed by meats, fruits, nuts, and vegetables, sugar, cocoa, rubber, and wine. The United States is not only the world's largest importer of meat, but the largest producer and consumer as well.

	U.S. share (percent) of world—			Ending stocks	Share of U.S. production exported
	Production	Trade	Consumption		
Wheat:					
1970/71	12	36	6	30	54
1978/79	11	45	6	24	66
1979/80 ¹	14	48	5	27	66
Feed grains:					
1970/71	25	42	24	43	13
1978/79	29	64	21	49	28
1979/80 ¹	31	70	21	54	32
Rice:					
1970/71	1	19	1	3	55
1978/79	2	21	1	4	57
1979/80 ¹	2	23	1	5	60
Soybeans:					
1970/71	81	90	40	85	59
1978/79	69	71	30	55	59
1979/80 ¹	70	70	29	66	54
Cotton:					
1970/71	19	22	15	20	38
1978/79	18	32	10	19	57
1979/80 ¹	23	33	10	25	45

¹ Forecast.

AGRICULTURAL AND NONAGRICULTURAL TRADE BALANCES, 1930-79

[In billions of dollars]

	Agricultural			Nonagricultural balance	Total balance
	Exports	Imports	Balance		
Calendar year:					
1930	1.2	1.5	-0.3	+1.0	+0.7
1935	.7	1.0	-.3	+.5	+.2
1940	.5	1.3	-.8	+2.1	+1.3
1945	2.3	1.7	+.5	+4.9	+5.4
1950	2.9	4.0	-1.1	+2.5	+1.4
1955	3.2	4.0	-.8	+4.9	+4.1
1960	4.8	3.8	+1.0	+4.4	+5.4
1965	6.2	4.1	+2.1	+3.7	+5.8
1970	7.3	5.8	+1.5	+1.3	+2.8
1972	9.4	6.5	+2.9	-9.3	-6.4
1973	17.7	8.4	+9.3	-8.0	+1.3
1974	22.0	10.3	+11.7	-14.8	-3.1
1975	21.9	9.3	+12.6	-2.8	+9.8
1976	23.0	11.0	+12.0	-20.7	-8.7
1977	23.7	13.5	+10.2	-40.0	-29.8
1978	29.4	14.8	+14.6	-46.4	-31.8
1979 ¹	33.2	16.6	+16.6	-40.0	-23.4

¹ Forecast.

This year's record U.S. agricultural imports of a projected \$17.5 billion implies another record U.S. agricultural trade surplus of over \$20 billion. With a nonagricultural trade deficit running in the neighborhood of \$40 billion in 1978-79, the agricultural sector has again gone a long way toward easing U.S. balance of payments problems.

Transportation

Probably the greatest limitation the United States faces in realizing the enormous level of exports projected for 1979-80 will be transporting farm products to the port. This problem is also affecting movement to domestic markets.

Labor difficulties slowed shipment of grains through some major elevators this past summer and heavy traffic has clogged some waterways. Major railway problems, spot railcar shortages, tight energy supplies, and rising fuel prices could further add to transportation difficulties as the United States attempts to move an unprecedented volume of grains, oilseeds, and other farm commodities to domestic markets and ports.

KEY COUNTRY AND REGIONAL PROSPECTS

Soviet Union

The Soviet role in world agricultural trade has hinged on two variables: yearly grain production and the Kremlin's commitment to improving domestic diets.

The Soviet Union in good years has surpassed the United States in total grain production. However, most of its grain acreage is in areas that would be considered marginal by U.S. standards and consequently are quite vulnerable to weather variations. For example, only 1 percent of Soviet farmland receives an average of 28 inches or more rain per year, compared with an estimated 60 percent of U.S. farmland.

Only in recent years have the Soviets amassed a significant amount of modern grain storage facilities, which has made it difficult for them to store excess supplies after a good harvest. It is interesting to note that the Soviet Union accounts for about 15-16 percent of the world's grain usage, but only 8 percent of oilseed use. Increased usage of protein meal would yield much more efficient feeding rations for the growing Soviet livestock industry.

Since 1972 the Soviets have protected diets and expanded livestock production by importing grain to compensate for domestic shortfalls. The 5-year bilateral agreement, now entering its fourth year, guarantees the Soviets a supplier and alleviates much of the uncertainty U.S. exporters associate with this market.

People's Republic of China

Like the Soviet Union, China's involvement in the agricultural marketplace rests mainly on political decisions on improving diets. The Chinese had not purchased U.S. agricultural products for 23 years when they resumed importing from the United States in 1972, though on a small scale. Chinese imports of U.S. grains, oilseeds, and cotton exceeded \$600 million in 1973 and 1974 and should be over \$800 million in calendar 1979.

With a population of nearly a billion people, the potential of the Chinese market is staggering. The Government apparently is committed to improving the diets of its people. The Chinese are now importing the technology to improve their food production and processing ability in the longer term and the food and foodstuffs to protect diets in the short term. Chinese purchases will be constrained for the time being, however, by their limited availability of foreign exchange and by rising world grain prices.

India

The 1970's saw a transition for India that was a mirror image of the Soviet Union's. An unprecedented four consecutive good harvests from 1975-76 to 1978-79 enabled India to build up its stock levels and evolve from one of the world's leading grain importers to a net exporter the past 2 years. This year's damaged crop will jeopardize that development, however—total grain production is expected to fall about 13 percent.

Argentina

A combination of changing Government policies and an excellent resource base has helped Argentina establish itself during the 1970's as one of the world's leading exporters of grains, oilseeds, and live-

stock products. Argentina has great potential for further expanding production and exports. In fact, its only major constraints are the capacity of its port facilities and its domestic transportation problems.

In favorable growing years, Argentina's corn yields rival those of the United States, and that is achieved with only minimal inputs of fertilizer and pesticides. With substantial amounts of additional cropland available and with Government policies meant to improve productivity and encourage exports, Argentina's share of world trade, particularly of soybeans, is likely to continue to grow during the 1980's.

Brazil

Brazil has become the second largest producer and exporter of soybeans during the past several years and, like Argentina, it has the potential to extend its market share. Most of Brazil's increases in production have come through expansions in area rather than improved yields and much uncultivated land still awaits the plow.

With population and income rising, however, Brazil still has to import large quantities of food. Major steps are underway to expand agricultural production.

High-income East Asia

The rapidly growing countries in East Asia—Taiwan, the Republic of Korea, Singapore, Hong Kong, and Malaysia—have become major consumers of agricultural commodities. Economic growth in this region has been phenomenal at about 8 percent per year. In many ways these nations seem on a path not unlike the one Japan followed a decade or so ago. Annual use of grains in this region of the world in the 1970's has been over 4 percent per annum compared with a little over 2 percent for Japan. Consumption of red meats and especially poultry has expanded significantly in this part of the world as more and more animal protein has moved into the diet.

While production of grains is relatively small in this part of the world, crops have generally been good in 1979–80. This is in contrast with the situation in the centrally planned countries of Southeast Asia that have been ravaged by poor weather, political turmoil, and war.

Middle East

With the emergence of the OPEC nations, no area of the world demonstrates as strong a growth potential as North Africa and the Middle East. Meat consumption in the OPEC countries of this region has been increasing at an average annual rate of over 14 percent per year with annual consumption of poultry increasing as much as 20 percent per year in the 1970's. Although incomes are highly skewed in this region, it is becoming an increasingly important market for some of the food exporting countries of that part of the world.

IMPLICATIONS FOR RETAIL FOOD PRICES

Sharp increases in prices for livestock and products—particularly cattle—beginning late in 1978 and continuing through last April set the stage for sharp increases in retail food prices in early 1979. From January through May, the monthly increase in retail food prices averaged 1.3 percent. As livestock prices at the farm level declined begin-

ning in May, the increase in prices for food at the grocery store began to slow.

With farm prices weakening more than those at retail, the spread between farm and retail prices widened sharply during the early summer months. As a result, the President called a number of major food retailers to Washington in August to discuss the wide spreads between farm and retail prices. Retail prices did decline for the month of August and increased modestly in September. For the balance of the year large pork, poultry, and fruit and vegetable supplies suggest only small increases are likely in the overall retail food price component of the CPI.

Most of the increase since mid-1979 has reflected rising costs of marketing and processing food. However, net profit data suggest that retail food chains have done unusually well in 1979.

For the year as a whole, it appears that retail food prices will average about 11 percent higher than 1978. During 1978 food prices averaged a tenth above the previous year.

For 1980, it appears that meat supplies will continue to be large at least through the first half of the year. Pork and poultry slaughter are running at record levels and producer prices are depressed below the cost of production. As a result, production of hogs and broilers will likely be cut back in the second half of 1980. With live animal prices depressed and large fruit and vegetable supplies expected, retail food price increases should be fairly modest through the first half of 1980. In fact, most of the price rise will probably reflect the increased cost of processing, transporting and marketing food.

Reduced supplies of pork and poultry and stronger live animal prices in general point to upward pressure on retail food prices during the second half of 1980. This kind of a pattern—modest increases in the first half year and stronger rises in the second half—is in contrast to the pattern of food prices that we have experienced in recent years.

For the year as a whole, it now appears that retail food prices will average somewhere between 7 and 11 percent above the 1979 level. The cost of marketing and processing food in 1980—always heavily influenced by the overall rate of inflation—will probably rise in the neighborhood of 9 to 12 percent from the 1979 levels.

U.S. PRICES, INCOME, AND UNEMPLOYMENT¹

Year	Inflation rate	Real income change	Unemployment rate
1970.....	5.9	3.0	4.9
1971.....	4.3	2.6	5.9
1972.....	3.3	3.3	5.6
1973.....	6.2	5.9	4.9
1974.....	11.0	-2.2	5.6
1975.....	9.1	1.3	8.5
1976.....	5.8	3.0	7.7
1977.....	6.5	3.4	7.0
1978.....	7.7	3.8	6.0
1979.....	11.1	.7	6.1

¹ Inflation rate reflects annual percent change in consumer price index for all items. Real income as measured by annual percent change in real per capita disposable income in 1972 dollars. Unemployment rate is annual rate for all workers.

Source: Department of Commerce and Bureau of Labor Statistics.

IMPLICATIONS FOR FARM INCOME

The farm income situation in 1979 has turned out better than originally expected. Record U.S. crops, coupled with strong domestic and foreign demand, have boosted farmers' returns. As a result, net farm income is expected to total \$30-\$32 billion, compared with last year's \$28 billion. This increase is occurring despite a 10-12-percent rise in farm production expenses.

For 1980, the picture is less promising. Crop receipts will be up for most major commodities in the year ahead with the possible exception of oilseeds. Receipts from the marketing of livestock products will be steady, or up only fractionally, reflecting lower returns for hogs and broilers. With only a modest growth in demand for food and agricultural commodities expected in 1980, cash receipts are likely to rise only modestly. Production expenses, however, will continue to surge, fueled by the underlying rate of inflation in the economy. This means that producers are likely to be squeezed, particularly in the latter part of 1980.

Input prices for most of the items that farmers buy are determined in markets in which firms often have considerable control over output. Thus, manufacturers are often able to gear output in line with demand to produce prices that will cover their costs. Fuel prices have risen about 40 percent in 1979 and are likely to continue their rapid advance in the year ahead. Fertilizer prices are expected to rise more than the overall rate of inflation, reflecting a tightening in nitrogen and phosphate markets.

The only exceptions to the overall pattern of rising prices may be feed, pesticides, and some other farm chemicals whose prices may advance somewhat less than the rate of general price inflation. Most other items can be expected to advance sharply and put a severe pinch on many producers.

While the rising cost of farm production inputs will cause producers to make adjustments in their operations, it is difficult in the short run to predict what changes will occur. For example, as input costs rise, farmers may shift toward less energy intensive commodities. Also, they are likely to take steps to reduce energy requirements in individual operations to the extent that adjustments are possible. However, predicting such actions is extremely difficult—it is an area in which we need considerably more analysis.

On the balance, with cash receipts likely to rise only slightly in the year ahead, and farm production expenses likely to increase roughly in line with the rate of inflation, net farm income for 1980 could slip into the mid-\$20 billion range. This would be a sharp fall from the 1979 level. Producers of pork and poultry likely will be squeezed throughout most of the first half of the year before they cut their operations back. Crop producers, particularly in high-cost areas, will face severe squeezes for much of the year ahead.

U.S. TRADE OUTLOOK

(By Thomas R. Saylor, Foreign Agricultural Service, U.S. Department of Agriculture)

We have behind us a very good year in agricultural trade—a year when agricultural exports set new records in value, of \$32 billion, and in volume, which totaled more than 125 million tons.

We expect continued export growth in fiscal year 1980.

We project exports to increase by almost 20 percent in value this fiscal year to about \$38 billion and about 16 percent in volume. We expect shipments of wheat, feed grains, and soybeans, our leading export commodities, to total more than 130 million tons, compared with 112 million last year.

At the same time, the value of agricultural imports in fiscal 1980 is pegged to rise at a slower rate, probably to \$17.5 billion, which could give the United States an agricultural trade surplus of more than \$20 billion for the year. It was \$15.8 billion in fiscal 1979.

Most of the export growth will come from higher prices and a larger volume of grain shipments. Soybean exports are likely to rise about one-tenth in volume, but lower prices are expected to hold the value of export trade in soybeans and other oilseeds and products to not much above last year's \$8.7 billion.

Value gains are expected in all export categories.

The need to improve the total U.S. trade balance, which was in deficit by about \$23 billion in fiscal 1979, puts added pressure on the United States to maximize its agricultural export potential.

I would like to focus for a few minutes on those factors which can affect agricultural trade in general and some of our more important commodities in particular—the things we should be watching as the export year unfolds.

There is weather, of course, which already has sharply reduced production in the Soviet Union, Eastern Europe, and India, and which will influence harvests of soybeans, feed grains, and wheat among our competitors in the Southern Hemisphere this winter and next spring. But there are other factors which can have a substantial impact on the level of trade in the coming year.

There is the condition of the world economy. Economic growth—more people with more money—helped generate the sharp growth in demand for food that resulted in the dramatic increase in U.S. agricultural exports of the past 10 years. That growth is slowing, as we have learned earlier on this program, with gains pegged at 3 percent or less in the major developed countries, except for Japan, where the prospect is somewhat better but still well below recent historical levels.

It is worth noting here that the developed countries are becoming less of a factor in the world market for U.S. agriculture than they

were in the past. They represented about half of our total exports last fiscal year compared with two-thirds 10 years earlier.

The share of the other countries—developing and Communist—has risen accordingly. So it is important to U.S. farm exports that economic growth in the developing countries, although slowing, is expected to continue at a pace ahead of that of the industrial nations, and that important decisions in Communist countries can be based on political considerations involving consumer needs as much as on economic growth.

We expect those destinations to account for most of the export growth in fiscal year 1980.

On the monetary scene, the value of the dollar in relation to other major currencies has appreciated overall since last year's outlook. This has made our prices somewhat less competitive with other suppliers. In Europe, where there is no levy on our soybeans it has made our soybean prices less attractive.

We must watch the impact of inflation on commodity prices. To what extent will commodities become a substitute for money in an unstable monetary climate? This is impacting now, and it could obscure, or even override, market fundamentals, generating much more erratic movement in commodity prices. This may affect buying decisions of countries already imparted by oil-induced balance-of-payments difficulties.

Energy as been discussed, and what happens in oil is basic not only to the world economic climate but to agricultural production and to how well the transportation systems of the world function—or if they function at all.

Even without the instability of the oil market, the expansion in world trade has put a severe strain on facilities to handle and transport the export volumes required to fill world demand, and demand has outstripped the distribution capabilities in some countries.

Among our competitors, export expansion has actually been curtailed in Canada and Australia because of logistical problems. In our own country, the Duluth-Superior ports and the Rock Island Line were shut down for a time this year. This, combined with structural constraints such as inadequate investment in rail facilities and the barge bottleneck represented by lock and dam 26, has exacerbated worries about our own transportation systems. Frankly, some people feel that it was touch and go to move the record 127 million tons of major bulk commodities exported in fiscal 1979.

Our transportation system will be tested even further to move the projected increase in fiscal 1980.

Taken together, those general factors that will influence agricultural trade in the coming year do not appear to be a sturdy hook on which to hang an agricultural export increase of about one-fifth. However, when you examine the outlook in the major commodities, the basis for the projection becomes more clear.

Over the past 10 years, annual world trade in wheat and coarse grains has increased by about 90 million tons, and the United States has supplied almost 75 million tons, or more than 80 percent, of the increase. In that same period, the United States has supplied nearly all the increase in world feed grain trade, which has more than doubled and is the fastest growing component of the trade in grains.

The 10-year record of growth in grain trade indicates that competitor countries have not expanded their production to meet the rising demand. There are reasons for this—geographic and otherwise.

In the case of wheat, I have mentioned the logistical problem that have hampered export expansion in Australia and Canada. Geography and climate limit the potential for feed grains in those same two countries, and corn growers in Argentina can—and do—trade off corn for soybeans in their production patterns. South Africa, a corn competitor, has port constraints on exports.

All of this implies the increasing importance of the United States as the primary supplier of the growth in demand for grains, at least in the near term.

In this situation, our forecast for 1980 is that U.S. grain exports will increase by 15 to 20 million tons while those of other exporting countries will be virtually unchanged. We expect feed grain exports to be up by 10 to 12 million tons and those of wheat by about 6.

Even so, our forecast of a substantial increase in U.S. grain exports is tentative and the outcome still depends on several key factors that we need to watch as the year unfolds.

The biggest factor is the Soviet Union, and its response to the substantial shortfall in grain production this year. We have assumed that the Soviets are committed to maintain feeding rates as they have in the recent past when faced with the choice of importing grain or slaughtering herds.

The final level of Soviet imports, the ratio of wheat to corn, and how much the Soviets will buy from sources other than the United States it still to be determined by the Soviets themselves and by the effective limits of their internal transportation.

Nothing to date has indicated they plan to change the pattern, and that is the key factor in the optimistic assessment of world trade in grain—we project imports by Russia of 32 million tons of wheat and feed grains from all sources.

For our part, we have agreed with them on a supply level of up to 25 million tons of U.S. wheat and corn during this October–September year—the fourth year of the grains agreement between us. The Soviets bought 15.7 million tons of these grains from the United States last year.

The situation in India also must be watched carefully. This year's monsoon was weak and erratic, and the fall harvest is disappointing. Drought has caused concern in areas now being planted for harvest next spring. Wheat and groundnuts will be most directly affected, and the outcome will depend largely on the availability of water and energy for irrigation.

Four consecutive record grain crops have changed India's status from a leading importer of grains as recently as 1975–76 to an exporter of 1 million tons in 1978–79.

That appears likely to change, but we do not see India's return as an importer in the immediate future. Despite reduced production prospects, India has food grain stocks of about 20 million tons. These should allow it to postpone grain import decisions until it can assess the harvest next April and May.

The stocks are held by the Government, so the key question is how the Government will respond to any prospect of shortage among consumers. Will they import, and if so, how much?

A significant share of the increase in grain demand has come from the middle-income developing countries, where diets are shifting to animal products, which in many cases can be produced only from imported grains. Many of these countries are feeling a balance-of-payments pinch as increased oil prices absorb their available foreign exchange. Deterioration in the world economic situation could slow demand for these grains, especially among those countries they rely on exports of industrial materials.

China, a customer for about 6 million tons of U.S. wheat and corn last year, is winding up the harvest of what is reported to be its second consecutive record crop of grain. China will almost certainly cut back imports from last year, but how much remains to be seen.

World markets will be significantly affected by the policies of governments that insulate their internal grain economies from world supply and demand conditions. An improved harvest in France over earlier prospects could bring the European Community in the world market with subsidized exports of wheat. This occurred last year at a cost to the United States of a significant volume of trade in third country markets. Over the past 10 years, the EC has averaged about 5.6 million tons of wheat and flour exports annually to third country markets. Last year, the EC exported 7.7 million tons to these markets. We will be watching closely how they handle this year's excess production.

Finally, Japan's huge surplus of rice remains a problem. The Japanese have begun to unload the surplus in third country markets. They are diverting land toward other crops such as wheat. How far they go with these measures will influence our exports not only of rice, but also feed grains and wheat.

Feed grains, wheat, and oilseeds and their products make up about two-thirds of the value of U.S. exports. As I noted at the outset of this talk, we project little change from last year's export total for oilseeds in fiscal 1980.

Supplies will be up substantially from last year—bordering on surplus, as Dawson Ahalt pointed out. At the same time, tendencies toward recession in much of the world and a leveling off of the rate of increase in world livestock production will weaken demand, which should put downward pressure on prices. This would be particularly true in the second half of the season, as the demand factors take hold and Southern Hemisphere soybean crops come on the market.

Many factors will influence the timing and extent of the price and export movement in the context I have described. These include how much of their 1979 crop soybeans U.S. farmers decide to hold and for how long; crop developments in India, Brazil, and Argentina, and the general factors of transportation capacity and cost, and the prospects for 1980 Northern Hemisphere crops.

Then there are trade policy issues. These have not changed much over time in the oilseeds sector, but they have lain dormant in recent years because of favorable market conditions.

However, the subsidy practices of our competitors or import substitution programs of our customers would have a major influence on the evolution of world markets.

I think we can conclude from what I have been saying that there are more uncertainties besides weather in this year's agricultural export outlook than perhaps at any time since these forecasts were started.

The world economic outlook over this next year is not good, monetary exchanges are volatile, the energy outlook is precarious, and political decisions will outweigh market fundamentals as a factor in some of the major outlets for basic U.S. commodities.

I want to mention one more factor that can have a major influence on the future of U.S. agricultural trade—more so in the years beyond than in 1980.

I am referring to the Multilateral Trade Negotiations that were concluded last spring. The first effects of the MTN will begin to be felt in 1980 as MTN participants start to implement the tariff reductions and quota enlargements that were agreed upon.

For the most part the liberalization will occur in stages, but in some cases entire concessions will go into effect January 1.

But more important than product concession—and the greatest achievement for U.S. agriculture in the MTN—will be the implementation of the codes that were negotiated to control the use of nontariff barriers to trade.

As participating countries approve the codes, which will apply to practices such as export subsidies and discriminatory product standards, international committees will be organized to begin their work.

The codes won't end these practices, but they will provide a foundation from which to build, over time, a body of international law that can reduce, and, we can hope, some day eliminate nontariff barriers as the major impediment to agricultural trade.

The MTN agreements won't solve the problems of international trade—they won't eliminate the impact of economic conditions, oil, weather, and the many other factors. But they do provide new rules and new opportunities for cooperation in international trade, and that trade is crucial to the economic future.

There are no "policemen" to enforce fair trading practices. The system works because each participant expects the other to play the game fairly. Once that sense of common confidence fails, so does the system.

Slower economic growth and unemployment in our key markets will seriously test the strength of the system in the years ahead.

Frankly, domestic inflation in this country will intensify the debate over the virtue of exports versus short term actions aimed at addressing consumer demands for quick solutions to their eroding real income. The weight of domestic farm policy and trade policy decisions may reflect these concerns.

Unfortunately, protectionism in this country is no longer dramatized as it recently was over TV sets, shoes or steel. Border protection increasingly has become taken for granted.

Export demand will remain, but the years ahead will determine whether the United States takes a course which will ensure or retard the expansion of trade. The leadership is largely in our hands.

Several other major issues loom on the horizon with profound implications for U.S. agriculture:

How are our needs for Mexican oil going to involve our agricultural interests?

How can we keep grain from becoming a pawn in our relations with the Soviet Union?

To what extent are we going to be drawn into bilateralism as a basis for development of bigger markets? Some would suggest such a strat-

egy for China. I remain convinced that our share of that market has no relationship to the bilateral understandings of other suppliers but is related to our competitiveness.

To what extent are we going to enforce the new subsidies code that was negotiated in the MTN? Already the export subsidy policies of our competitors are causing American farmers to lose income.

These issues will form the political context in which the opportunities for growth will be determined.

Here are summaries of the export outlook by commodity:

Wheat.—Wheat production outside the United States is down about 12 percent in 1979–80. The Soviet Union accounts for much of the decline, but production is also down in Eastern Europe, Western Europe, and Canada. The U.S. crop is forecast up 17 percent, and exports are expected to rise about 18 percent to 38 million tons. Supplies are large in competing exporting countries, but handling difficulties will limit export expansion.

Feed Grains.—World coarse grain trade is expected to expand from 90 million to about 101 million tons in 1979–80. U.S. exports are also expected to increase by over 11 million tons to 71 million as reduced crops and transportation constraints limit exports from other suppliers.

Soybeans.—With an 18-percent increase in U.S. production in 1979, exports are expected to increase about 11 percent in volume. World demand for high protein feed continues to expand, and lower soybean prices should favor feeding of meal over grain. Soybean production in Brazil and Argentina is expected to recover in 1980, but these suppliers will not be available for export until next April–May. Since current soybean supplies in these countries are near last year's low level, U.S. exports are expected to continue strong during October 1979–April 1980. Nearly 70 percent of U.S. soybean exports are normally shipped during October–April.

Rice.—The exports outlook remains strong, largely because of the 1978–79 production shortfall in Korea and expanding demand in the Middle East. U.S. exports are expected to reach a record volume of about 2.7 million tons.

Cotton.—U.S. exports are expected to increase about 3 percent in volume. World demand for cotton expanded sharply in 1978–79, but the projected slowdown in economic growth will likely limit the increase in cotton consumption in 1980. U.S. production is estimated up one-third, at 14.4 million bales, while foreign production is forecast up only 1 percent. At the beginning of the marketing year (Aug. 1, 1979) foreign stocks were at their lowest level since 1971.

Livestock and Products.—The quantity of U.S. cattle hide exports could slip due to continued reduction in U.S. cattle slaughter. Beef export volume and value are projected to rise significantly. Improved market access for U.S. high quality beef in Japan and the European Community, as a result of the recently concluded multilateral trade negotiations, should account for a large part of the increase. Little change is expected in U.S. pork exports because of expanded production in Canada. Tallow exports are expected to remain near the fiscal 1979 level.

Poultry.—Continued growth in poultry meat exports is anticipated with increased sales to the Caribbean, Venezuela, Japan, Hong Kong, Singapore, and the European Community.

Tobacco.—Exports are expected to match the 1979 volume. Prices are likely to average 7 to 10 percent above 1979 although quality may not match last year's high level. Other factors impacting shipments of U.S. leaf include relatively high stocks of U.S. leaf held by many importers, record high interest rates, and a general slowdown in world leaf use.

Fruits and Vegetables.—Export volume is expected to surpass the fiscal 1979 level because of expected large harvests of several major export crops—apples, oranges, pears, almonds, walnuts, and raisins. Growth in the Far Eastern markets is expected to continue. Export value is expected to exceed receipts in 1979 by approximately one-fourth. Higher unit values for most export items are anticipated.

U.S. AGRICULTURAL EXPORTS: VALUE BY COMMODITY, FISCAL YEARS 1977-80

[Billion dollars]

Commodity	Fiscal year—			
	1977	1978	1979	Forecast 1980
Grain and feed.....	10.124	11.711	13.634	18.5
Oilseeds and products.....	6.403	7.453	8.692	9.1
Cotton, including linters.....	1.538	1.707	1.910	2.0
Tobacco.....	1.065	1.132	1.292	1.4
Fruits, nuts, and vegetables.....	1.649	1.880	2.066	2.5
Sugar and tropical products.....	.531	.580	.740	.7
Livestock and products.....	2.191	2.352	3.160	3.3
Dairy products.....	.171	.159	.120	.1
Poultry products.....	.301	.332	.363	.4
Total.....	23.974	27.306	31.983	38.0

TABLE 4.—U.S. AGRICULTURAL EXPORTS: VOLUME BY COMMODITY, FISCAL YEARS 1977-80¹

[Million metric tons]

Commodity	Fiscal year—			
	1977	1978	1979	Forecast 1980
Wheat.....	23.766	31.813	31.340	37.0
Wheat flour.....	.957	1.021	.877	1.0
Feed grains.....	50.602	55.545	59.499	71.1
Rice.....	2.319	2.276	2.397	2.7
Other grain products.....	.690	.775	.861	1.0
Feeds and fodders.....	3.990	3.603	4.304	4.0
Soybeans.....	15.156	19.686	20.194	22.5
Soybean meal.....	4.117	5.516	5.996	6.4
Other oilcake and meal.....	.147	.324	.294	.3
Soybean oil.....	.702	.933	1.059	.9
Other vegetable oils.....	.449	.541	.460	.5
Sunflower seed.....	.403	.906	1.342	2.7
Cotton, including linters.....	1.042	1.378	1.395	1.4
Tobacco.....	.290	.272	.287	.3
Fruits, nuts, and vegetables.....	3.219	2.904	2.807	3.1
Beef, pork, and variety meats.....	.349	.340	.326	.3
Poultry meat.....	.194	.194	.208	.2
Animal fats.....	1.379	1.281	1.276	1.1
Other.....	2.095	25.62	2.574	2.5
Total.....	111.866	131.870	137.496	159.0

¹ Shown in actual export tonnages not converted to product equivalents. Excludes animal numbers and some commodities reported in cases, pieces, dozens, liquid measures, etc.

24 OUTLOOK AS VIEWED FROM ABROAD [3]

(By Robert A. Bain, Assistant Director, Bureau of Agricultural Economics, Australia)

Developments in world markets are of vital concern to farmers in both the United States and Australia. This is because of the strong export orientation of much of our agriculture. The United States is the major supplier of food and feedstuffs to the world market and a major supplier of natural fibers. Australia is a much smaller producer of agricultural products but because of the relative smallness of our home market we are even more heavily reliant on world markets than the United States.

For some commodities we are strong competitors on third markets—the most notable example is wheat. For others especially beef and sugar, the United States is particularly important to Australia as a major market. Overall, Australia provides about 5 percent of the United States agricultural imports.

World markets for agricultural commodities are inherently unstable and the prevalence of Government intervention in agricultural trade in support of domestic farm policies greatly affects conditions on world markets and adds to the uncertainties facing agricultural exporters. The export orientation of our agriculture is therefore one of the major factors contributing toward the characteristic volatility of the sector in our two countries and which poses great challenges for our agricultural producers, marketers, and policymakers.

In this paper I will briefly refer to some of the more important developments impinging on the world agricultural situation and review some recent assessments of the outlook for trade in Temperate Zone products into the 1980's. I will then make some observations about a few of the more pertinent issues concerning both our countries which seem to emerge from the developing situation and which might be further considered during the discussion period.

RECENT DEVELOPMENTS

The current world economic situation has been examined in some detail by other speakers. It is apparent that an already very difficult situation in the main industrialized countries has been exacerbated by the recent sharp rises in oil prices. In most OECD countries this has meant further downward revisions in estimates of already low economic growth rates, with the probability of the United States moving into a deeper recession; upward revisions in high inflation rates; and a worsening in the unemployment situation, except in the Federal Republic of Germany and Japan. Currency instability is expected to continue. Balance-of-payments situations are expected to alter sharply, with a major transfer of reserves from the industrially developed

countries to the OPEC countries. However, the non-oil-producing developing countries are expected to bear a much larger deterioration in their already high balance-of-payments deficits.

Despite the very unfavorable economic environment, world trade expected by around 6 percent in 1979, with the buoyant conditions being experienced by agricultural trade making an important contribution. Prices for several of the major temperate zone agricultural products—grains, beef, fibers—are at high to record levels—in money terms. This is mainly a reflection of supply factors. Grain prices, for example, are responding to the reports of a serious shortfall in the U.S.S.R. harvest and logistical constraints in moving grain in the main exporting countries. Meat prices are being influenced by the sharp contraction in beef supplies, which results from the decline in herds in the main trading countries. There also appears to be a movement into commodities, particularly the more storage products, in response to a very uncertain world economic outlook, rising inflation and freight rates and fluctuating exchange rates.

The current high price situation for some Temperate Zone products may be compared with the 1972-73 "boom." At that time, however, high economic growth rates were being recorded so that demand factors were also an important influence. It contrasts with the depressed returns of only a short time ago. Also, the high price situation does not extend to all Temperate Zone products—for example, prices for sugar and dairy products traded internationally still remain low.

The swings in agricultural commodity prices during the 1970's, illustrate the volatility of world agricultural trade and the varying effects which supply, demand and institutional factors have on different commodities. Variations in seasonal conditions make agricultural production inherently unstable, particularly that of annual crops in the short term, although their effects are more enduring for the perennial crop and livestock industries. On the demand side, changes in economic conditions and the uncertainties of the policy measures governments may take in response to them, are important sources of fluctuations in returns, particularly for commodities with higher income elasticities, such as beef and fibers. Moreover, the small proportion of world agricultural production which enters world trade means that relatively minor variations in production or demand in important trading countries can have a major influence on international trade. Particularly relevant here are the policies of some major trading countries which are almost solely concerned with the stabilization of their internal domestic markets and in effect export instability onto the world market; the EEC's variable import levy/export subsidy system is a notable example of this.

Within the volatile world agricultural situation there has been a number of important changes in trade patterns during the 1970's. One of the most profound of these occurred as a result of the United Kingdom's entry into the EEC. This major market for Temperate Zone products became virtually closed to many third country suppliers. By contrast, there has been a significant expansion in imports by the new industrially developing countries in Asia and by the newly rich oil producing countries of the Middle East. The centrally planned economies, too, have become a very considerable force in world trade, but a highly unpredictable one. Their large but irregular overseas pur-

chases of grain have been geared to the sharp changes in their own domestic production, something about which they have shown a reticence in supplying pertinent information, and for some commodities such as meat they have tended to be opportunistic buyers.

Despite these developments, the larger OECD countries have continued to provide major markets for several Temperate Zone products. Thus the bulk of the world's beef exports (excluding intra-EEC trade) is directed to North America and Japan. Coarse grain imports are heavily concentrated in Western Europe and Japan as are imports of wool.

There has been considerable activity in international forums with the objective of providing improved conditions of trade in agricultural products. Unfortunately progress in this direction has been very limited. For example, the Tokyo Round of the Multilateral Trade Negotiations under the GATT were substantially completed last April after almost 6 years of preparation and negotiation. In overall world trade terms the outcome of the MTN's, while falling short of the aims of the Tokyo Declaration, can be regarded as a significant achievement, particularly as they prevented a slide into a new protectionism in response to the economic pressures which developed during the negotiations. The positive achievements of the MTN's, however, relate almost entirely to conditions of trade in industrial products. For agricultural products, where the need for improvement was greatest, world trading conditions have scarcely changed; high and nonnegotiable levels of protection behind nontariff barriers and export subsidies remain.

Australia has been able to negotiate quantitative floors in principal markets for beef and dairy products and secured some reductions in tariff barriers (notably for wool in the United States). Other agricultural exporters have also negotiated improved bilateral positions. There are benefits too, in the new multilateral arrangements for dairy products and the new consultative machinery for meat. Nevertheless, given the aims of the Tokyo Declaration and 6 years of negotiation the results of the MTN's can only be viewed as disappointing and marginal by agricultural exporters.

In other important international negotiations, a new International Sugar Agreement has been concluded but the EEC, which is the major producer, is not a member, and the United States, which is the major importer, has yet to ratify.

Despite detailed negotiations extending over several years, a new international grains arrangement is not yet in sight. The complexities of arriving at a Wheat Trade Convention—a commercial agreement—with equitable sharing of benefits and costs, are formidable. On top of these, the strongly voiced aspirations of developing countries to achieve world food security within the context of a new international economic order have increasingly impinged upon the negotiations. In the absence of an international agreement, the recently instituted regular discussions and exchanges of information between the major exporters may make a useful, though less ambitious contribution toward stabilizing international trade.

OUTLOOK

The immediate outlook is for a continuation of the strong price situation into 1980 for most of the major Temperate Zone products. This

is reflected in the most recent forecasts made by the BAE for the Australian rural sector. We estimate that despite an 8 percent drop in volume, the gross value of agricultural commodities produced in Australia will rise by 5 percent in 1979-80 to a record \$A11,125 million. We estimate that the value of our exports of agricultural origin will rise even more dramatically by 24 percent to \$7,400 million in the 1979-80 fiscal year, reflecting the strong overseas demand for the output of our grain and grazing industries.

The strong price situation, however, is mainly a reflection of supply factors which have outweighed the effects of the worsening general world economic outlook, and a movement into commodities in view of high inflation and freight rates and unstable currency exchange rates. The short term commodity situation is therefore very fluid. The economic slowdown in industrial countries and oil importing developing countries could weaken demand for some agricultural products particularly those that are relatively more responsive to changes in income. On the other hand the current high rates of inflation, instability in world currency markets and rising energy costs and ocean freight rates could continue to trigger increased buying interest in storable commodities putting upward pressure on prices despite a possible weakening economic demand. Given the current tight supply position for many major agricultural commodities, recent economic developments point to a greater price sensitivity in agricultural trade, albeit around the current high levels.

Future developments in the world economy are particularly uncertain at this time. Much will depend on the length and severity of the United States recession and the evolution of economic growth in Europe and Japan. Particularly relevant will be the success of measures taken to reduce inflation and the extent to which the economies in the major developed countries are able to adapt to an era of much higher priced energy.

Should the serious economic situation persist in the OECD countries, its effects must spill over into the new industrially developing countries whose economies are oriented toward trade with the OECD countries. Continued low or negative rates of economic growth would have a particularly adverse effect on the more income elastic products such as meat and the related feedstuff industries, especially if they coincide with the expected cyclical recovery in beef production in the early 1980's.

Thus, there are certainly clouds on the horizon. The weight of opinion among analysts, however, still seems to be one of optimism about a general improvement in the world economic situation within the next couple of years. Positive rates of economic growth are still occurring in most industrially developed countries, and there does seem to be a considerable consensus that the U.S. economy will move out of recession during 1980.

Studies of longer term trends point to a continued expansion in world trade in most Temperate Zone products during the 1980's.

Last year the FAO completed a series of projections to 1985 for several of the major Temperate Zone products. These are based on assumptions of constant real prices and constant policies prevailing at the mid-1970's and on two assumed rates of growth in real incomes: "Basic" projections assuming a rate of economic growth up to 1985

broadly in line with past trends, adjusted to take account of recent developments; and "supplementary" projections based on a rate which assumes faster economic growth. The following results were obtained for meat, cereals, and sugar.

At the world level, aggregate net import requirements and net export availabilities of meat and live animals were projected to reach 8.7m tons (carcass weight equivalent) in 1985, compared with aggregate actual net exports (including intra-EEC trade) of 86.9m tons in 1972-74. A somewhat greater volume of international trade is indicated by the supplementary projection. The projections suggest that beef would continue to be the most important meat traded, but that the expansion of trade in sheepmeat would be faster. Trade in beef, veal, and live cattle is projected to rise by about one-sixth and sheepmeat by almost 80 percent.

Aggregate world import requirements of coarse grains are projected to increase from 72m tons in 1975-76 to 100m tons by 1985. Most of the increase is foreseen in developing countries and may well not even-tuate as actual trade because of the difficulties of some developing countries in financing such heavy imports.

In the basic projections, world import requirements of wheat are estimated at 69m tons in 1985 compared with actual net imports of 63m tons in 1975-76. This growth rate of 1.1 percent per annum would be much lower than that of 3.3 percent per annum during 1962-64 to 1975-76, which covered a period of major expansion in world trade. The slowdown reflects an anticipated increase in self-sufficiency in both Western and Eastern Europe, and a reduction in the needs of the U.S.S.R. after the massive expansion in the early 1970's. In contrast, the developing countries are expected to become more dependent on imports, despite their increased production. In the supplementary projections, because of assumed faster growth in production in importing countries, world wheat trade in 1985 would be some 12m tons smaller than in the basic projections and about 7m tons lower than recent average trade.

World trade in sugar is projected to continue to increase, but at a slower rate than in the past decade. World trade is estimated to grow by 1.2 percent per annum to 1985, compared with 2.3 percent a year during the decade up to 1972-74. Aggregate net import requirements are projected to rise to over 21m tons raw value in 1985, compared with 18.5m tons in 1972-74 and 14.8m tons in 1962-64.

In April 1978, the USDA published a series of projections to 1985 derived from the application of a mathematic model of the world grain—oilseeds—livestock market (the GOL model) to a number of alternative sets of assumptions about world economic growth, trade, and food policies. These projections indicated a growth in overseas demand for grain from the major exporters (United States, Canada, and Australia) of from 75 percent to 125 percent, with imports by the developing countries increasing appreciably faster than those of the rest of the world. They indicate that the commercial sector of the world meat economy will expand by one-third to one-half, and illustrate that while demand for meat will be significantly influenced by income and population growth, production and trade policies are likely to be more important factors determining levels of demand and trade in meats.

Earlier this year the BAE published a review of the longer term export prospects for Australian agriculture in which we endeavored to assess prospects in individual markets during the 1980's. This review indicated that the future direction and growth in our trade were likely to represent a consolidation of the pattern which had emerged during the 1970's. It highlighted the continuing fundamental importance of the larger OECD countries as markets for our exports, although they are likely to exhibit only modest growth. They will also continue to be among our major competitors on world markets. The main growth centers for our exports will be elsewhere—in the higher income developing countries of East and Southeast Asia, the Middle East, and China.

Among the developed country markets, Japan has a key place, taking about 25 percent of our total exports. Despite problems of access and variable import demand, it is of unique value as a market because of its diversity, size, and economic status. It ranks high among the markets for the majority of our agricultural exports. However, apart from beef, we do not expect any marked growth in sales during the 1980's.

The United States is a crucial market for our beef industry and is among the major purchasers of our sugar. It is, of course, our major competitors in world grain markets, and its policies have a major effect on the world cereal situation. Canada, too, is a major wheat exporter and is a significant market for our beef and an important and growing market for our sugar. The EEC is the largest trading bloc in the world. It is a large agricultural producer and trader. However, its common agricultural policy has resulted in steadily increasing EEC self-sufficiency for many Temperate products, a decline in dependence on imports, and the generation of large exportable surpluses. It is an important market for our wool, which is not subject to the CAP, but we have been increasingly affected by subsidized exports of EEC beef, sugar, wheat, butter, and skim milk powder to third markets.

The BAE's review indicated that there are very promising prospects for a substantial growth in Australian exports of a number of major commodities, including meat, sugar, wool, and grains, to countries in the east and southeast Asian region. Increased sales to those countries are of particular significance to Australia as they are in our immediate geographic locality. Their market potential derives from the interaction of a large population, considerable scope for further income growth, and the responsiveness of demand to increases in incomes. However, the continued economic expansion of these countries will be the most important factor influencing their growth as agricultural markets. Reciprocity in trade will be very important in expanding rural exports to the region.

The Middle East also has emerged as a remunerative market for agricultural exports. It has become an important market for Australian live sheep and sheepmeat, wool, and sugar industries have sound, long-limited ability to expand domestic production and, with rising incomes, import demand will continue to expand.

The People's Republic of China is now emerging as a major industrial and trading nation. Current Chinese leadership and planning emphasize the modernization and mechanization of agriculture through

importing technology and plant and equipment. The potential for exports in these areas could be at least as great as for agricultural commodities. Wheat and sugar appear to be two products with good growth prospects on the Chinese market, and we also see a potential for increased wool exports.

The U.S.S.R. and Eastern Europe have increased their imports of agricultural products over the last decade, but the trade has been erratic with purchases of wool being relatively more stable than those of other commodities. Imports of wool should continue to expand over the coming decade, and sales of meat, grains, and possibly dairy products will probably increase, too, although demand is expected to continue to fluctuate from year to year.

The Latin American region has a large agricultural production base, large and rapidly growing population, and is a significant consumer and exporter of temperate agricultural products. However, the position of the Latin American region in relation of Australia either as a market or as a competitor, does not seem likely to alter significantly over the period to the mid-1980's.

Overall, the BAE's review indicated that Australia's wheat, beef, live sheep and sheepmeat, wool, and sugar industries have sound, long term export prospects. The export sectors of our dairy and fruit industries, on the other hand, have been contracting and this trend is likely to continue, although these industries will continue to export a sizable proportion of their output for some time to come. Even for those industries where long-term prospects appear sound, exports will continue to be subject to short term variations and uncertainty, and there is always the prospect of depressed demand coinciding with an upturn in supplies leading to sharp shortfalls in export returns.

SOME GENERAL ISSUES

If there are two features that stand out in any assessment of the implications of the current world outlook, they are first, that world trade in Temperate Zone products will continue to be characterized by uncertainty and problems of instability and market access. Second, although there may be good prospects for an expansion in trade in some commodities, there will be no letup in the longer term economic pressures on export-oriented agricultural industries. The agricultural sectors in both our countries face similar challenges in dealing with these phenomena. The issues involved are numerous and complex. I will confine myself to making some general observations which might provide useful openers to our subsequent discussion period.

Much of the uncertainty in agricultural trade arises from the inherent instability of agricultural production and demand. In Australia, we are gradually evolving policies to deal with this phenomenon that are designed to at least partially insulate producers from the effects of sudden major falls in prices without masking longer term market trends. Also, we are examining closely additional options in the capital, insurance, and futures markets, which may assist producers to offset the inherent riskiness of their farm operations. One such example has been the development of an income equalization deposit scheme. Un-

doubtedly, we have much to learn from the experience of the United States in the development of such mechanisms.

The inherent riskiness of agricultural trade is, however greatly accentuated by Government intervention so as to support domestic objectives of internal market stabilization, self-sufficiency, and income support for producers. Probably the most disturbing examples of this have arisen from the operation of the common agricultural policy of the EEC, which has given rise to periodic surpluses and deficits which are left mainly to the world market to accommodate. Policy implementation in major importing countries such as Japan has also given rise to market instability and access difficulties. Such policies may be reasonably successful in stabilizing domestic markets and ensuring food supplies, at a very considerable cost, but they move the entire burden of adjustment on to exporting countries and third markets. They always run the risk of ad hoc and protectionist reactions which can lead to market collapses. By destabilizing prices in international markets and by increasing the degree of uncertainty as to access in the future, they retard investment in potential production for export in low-cost countries. It is therefore regrettable that it was impossible to achieve any adjustments to existing trade regimes for agricultural products in the MTN's.

It does, however, stress the continuing need to participate actively in international negotiations and consultations to avoid to the maximum extent possible adverse effects of ad hoc and unilateral Government intervention in trade. More extreme actions are less likely while governments are continuing to conduct a dialog.

Most importantly, as pointed out by the BAE's Director Geoff Miller at your 1977 Outlook Conference, a concerted and fundamental scientific endeavor in the policy development field is also necessary. Political will, statesmanship, and negotiating skills are necessary but not sufficient if the current economic irrationalities of agricultural policies are to be removed.

In the wider trade context, it is highly relevant that the economies of those countries offering perhaps the best opportunities for an expansion in agricultural exports—the new industrially developing countries—are in turn very dependent on exports of manufactured products to the OECD countries. The realization of the potential for their expanded agricultural imports will be largely governed by the conditions of access that are given to their own exports. Some sections of secondary industry in Australia are accorded high levels of protection. Greater access is, however, being given to the products of our Asian neighbors, and there is increasing recognition of the importance of a more balanced trade with them.

Whatever may happen to the prices received by farmers, there is a seemingly inexorable upward movement in the prices paid for labor, materials and other inputs. This has accelerated with the surge in inflation which has affected most major trading countries and been further stimulated by the effects of rising energy prices. Indeed, the implications of rising energy prices are likely to be one of the major themes of this Conference.

In the BAE we have just completed a study of the implications of higher oil prices for the rural sector. Two different sets of implications

may be identified. The first relates to the production of alcohol fuel from agricultural crops. We concluded that large scale commercial production of fuel from this source is not economic at present, although it may be an economic proposition for some farmers to produce ethanol on farm for their own fuel requirements.

The second set of implications concerns the effects of rising oil prices on the economic environment under which farmers operate. We have calculated that the direct shortrun costs of the recent large price rises would be no more than between 3 and 6 percent of Australian farm incomes and that a large proportion of this would result from the once-and-for-all move to import parity pricing in Australia. Also, the dramatic rises in oil prices have provided an incentive for farmers to change their input and output mixes in order to maintain an efficient allocation of resources. Changes in management practices such as minimum tillage techniques and larger tractors, which are more efficient fuel users, can be expected to gain momentum.

The high oil prices also have implications for higher commodity prices, further inflation, balance-of-payment changes and world income transfers. The effects on agricultural commodity prices are by no means clearcut. Take the case of wool. On the one hand higher oil prices mean that synthetic fibers become relatively more expensive so increasing the demand for wool; on the other, lower incomes in major importing countries of wool and wool products mean that demand will be lower. For other commodities like sheepmeat, where sales to the Middle East are a large proportion of total exports, there could be significant revenue gains.

We consider that balance of payments and exchange rate considerations ensuing from rising oil prices could be the most significant issue for the rural sector. Because Australia is a net energy exporter with considerable potential for further growth, and because the prices of alternative energy sources tend to move in sympathy with the price of oil, Australia's balance of payments is likely to improve from higher oil prices. Such a beneficial situation for Australia society would, however, adversely affect the rural export sector. In these respects the implications of rising energy prices for Australian farmers are a mirror image of those for their counterparts in the United States. Ironically, the important issue for Australia's rural export industries may not be future oil shortages but an abundance of energy resources.

The final couple of matters about which I would like to make some observations are recent developments in the Australian wheat industry and the impending U.S. countercyclical legislation on beef imports.

Last season Australia harvested a record wheat crop of $18\frac{1}{4}$ million tons, about $3\frac{1}{2}$ million tons higher than the previous largest crop of 10 years before. Another large crop of around $14\frac{1}{2}$ million tons is expected this coming season. It is natural to wonder whether the Australian industry has moved on to a higher production plane with consequent implications for our role in the international grain market.

There has been a general expansion in the cropping area in Australia during the 1970's and this has been derived mainly from the diversion of land from purely grazing activities to permanent crop-pasture rotations. This has been associated with the trend toward larger farm sizes and greater investment in machinery which has significantly in-

creased the opportunities for timing sowing so as to take advantage of soil moisture conditions. Timeliness in cereal growing is particularly important in the generally lower and less reliable rainfall conditions prevailing in Australia's newer cereal-growing areas.

The effect of these and other adjustments has been to enable average incomes on cropping farms to be maintained at higher levels than those prevailing in the rural sector generally and to show a strong upward trend throughout the 1970's. The fact that these results have been achieved in the midst of accelerating input prices and mixed fortunes in both seasonal and marketing conditions, indicates the resilience and efficiency of the Australian wheat industry and its ability to compete on world markets.

There is no evidence of any significance of increases in Australian wheat yields since the early 1940's. Nor is there any convincing evidence to support the hypothesis that the leveling of the national average wheat yield has been associated with the expansion of wheat growing into climatically less favorable regions. Indeed, average yields in some of the newer wheat-growing regions are equal to or better than those in some of the traditional wheat-growing regions. Higher yielding varieties have been used recently but the dominant varieties are those which have been used for several years.

The main factor underlying last year's record crop seems to have been the extremely unusual coincidence of favorable seasonal conditions throughout the entire Australian Wheat Belt. Expectations of a further large crop this season stem mainly from an expansion in sowings of over 1 million hectares to a record 11.2-million hectares. As is normal, seasonal conditions have varied in different regions ranging from generally good in South Australia, Victoria, and much of New South Wales to dry in Queensland and northern areas of the western Australian Wheat Belt.

Research is continuing to assess the feasible limits for the cropping industries in Australia. Through developments in technology and crop varieties, farmers have displayed an increasing willingness to push the limits of crop growing further into climatically harsher areas. It is difficult to assess the technological developments and price scenarios which will prevail for the cropping areas in the eighties. On current indications, however, the economic limits to crop industry expansion have yet to be reached. The trend in Australian wheat output should therefore continue to move upward in line with the expansion in wheat area. Crop levels will vary each year in accordance with seasonal conditions and the prospect of some very large harvests over the coming decade must be considered.

Turning to the impending U.S. countercyclical legislation on beef imports, studies we have undertaken in the BAE indicate that this would represent another destabilizing influence in world agricultural trade, while having only a minimal effect in meeting its perceived objective of stabilizing the U.S. market.

Instability in the U.S. market will be largely generated internally or by factors unrelated to the level of beef imports. Its effects will not be offset to any notable extent by variations in imports which contribute only a minor proportion, usually less than 10 percent of total supplies.

By contrast Australian exports to the United States have represented well over 20 percent of our beef production and the level of access to, and prices on the American market are major determinants of the tone of the market in Australia. The development of the Australian beef industry over the last 20 years has been very largely based on the U.S. market. Indeed the Australian industry may be viewed almost as an extension of the American market, producing a commodity, lean manufacturing beef, for which the local industry can not supply the demand.

Under the proposed law, access for overseas supplies will depend critically on the rate and timing of the prospective buildup in the U.S. cattle herd. Simulations carried out in the BAE of possible production patterns indicate that trigger levels will probably fall substantially in the early 1980's from the relatively high level of access in 1979. This fall will be more severe in the event of a deeper recession in the U.S. economy or some other major disturbance causing further herd liquidation. Access as determined by the proposed law would probably remain below the 1979 level throughout much of the decade. However, if herd buildup is delayed, a return to high levels of access could be expected before the late 1980's.

The BAE's simulation exercise also indicates that the proposed law will cause import access to fluctuate more than trigger levels under 1964 formula. Greater variability of trigger levels is largely caused by the inclusion of a countercyclical factor in the quota formula which is based solely on the production level of cow beef; cow beef output is inherently more unstable than total commercial beef production. Thus the proposed law will tend to destabilize world markets. More particularly, because of the strong influence of the U.S. market on the Australian industry, Australian producers have responded to similar price stimuli to those influencing U.S. producers, and Australian production has tended to move in phase with changes in U.S. production. If this situation continues, the countercyclical law will cause sharp cutbacks in import access when our production is high and allow high import access when our supplies are relatively low. Thus it will have a destabilizing effect on the Australian market and on the flow of our exports to other markets.

CONCLUDING REMARKS

Despite the unfavorable world economic situation, world prices for many Temperate Zone products are at high levels and are expected to remain so into 1980.

Further developments in the world economy are particularly uncertain at this time and any prolonged worsening of the world economic situation must have an adverse effect on agricultural trade, particularly for the more income-elastic products.

Studies of longer term trends, however, point to a general expansion in trade in most of the major Temperate Zone products during the 1980's. Although the markets in the larger OECD countries will continue to be of fundamental importance to exporters, much of the growth is likely to occur in the new industrially developing countries and the oil-rich countries. However, the realization of this trade po-

tential, particularly in the new industrially developing countries, will depend on trade reciprocity on the part of the OECD countries.

Despite the general prospect of expanding trade in Temperate Zone products, international markets will continue to be characterized by uncertainty and problems of market access and instability and there will be no letup in the longer term economic pressures on export-oriented agricultural industries. The sharp increases in petroleum prices have added yet another element of uncertainty to the situation. The rural export industries in both our countries have shown remarkable resilience in adapting to market fluctuations and economic pressures and it is a major challenge to policymakers to facilitate a continuance of this process.

THE WORLD MARKET OUTLOOK FOR CEREALS, ANIMAL FEEDS AND LIVESTOCK PRODUCTS

(By Rowland Woods, Head, Markets and Trade Division, OECD)

I should like to commence this review of the short term world market outlook for cereals, animal feeds and livestock products by examining some of the elements which collectively create the background perspective for the agricultural commodity market outlook at any given time.

Perhaps the four most important "elements" are general economic trends, Government policy decisions, producer responses to such trends and decisions, and finally, the weather.

ECONOMIC TRENDS

The economic outlook, which will be a significant factor in determining the buoyancy of commodity markets and hence farm product prices over the next 12 to 18 months, is not good. Economic growth is likely to be, at best, sluggish, throughout the Western World, with continuing high unemployment, inflation rates remaining high and difficult to control, uncertainties concerning the international monetary system; and mounting worries over the prospective cost and availability of energy.

A major uncertainty at this stage is the likely effect of this general economic situation on effective demand for agrobased foodstuffs, particularly if for the family household fuel bills and lower disposable take-home incomes lead to changing patterns of consumer expenditures and, in particular, lower expenditures on food.

In the longer term, there must also be a comparable uncertainty as to the effect on patterns of farm production of higher costs of oil and oil-based products. Changes in the relative profitability of different farm enterprises, resulting from changes in relative costs of production, could lead to significant changes in production responses to traditional farm product price relationships. Even traditional agricultural institutions, such as the Dutch tomato industry or the conventional soyacorn price relationship in the U.S. Corn Belt could come under pressure as a result of the changes in relative input costs occurring at the present time.

GOVERNMENT POLICIES

Since the end of the Tokyo Round of Multilateral Trade Negotiations, most industrialized countries have expressed varying degrees of satisfaction with the results of the negotiations. However, most developing countries, and some developed agricultural exporting countries like Australia and New Zealand, have been expressing disappointment

that the tariff reductions and access liberalization achieved in the industrial sector were not matched by comparable reductions in protectionism in the agricultural sector. In fact, at a recent meeting of the FAO Committee on Commodity Problems, it was concluded that, overall, agricultural protectionism is in fact increasing at the present time. This conclusion was based on an appraisal of current trends, toward so-called voluntary restraint arrangements (of the type recently negotiated—or arranged—by the EEC on apples and manioc and by the United States on beef), and other nontariff restraints on trade, such as the increasingly exacting phytosanitary regulations being introduced by some countries.

On the other hand, it must be recognized that under current economic circumstances, most governments (the EEC for example) are showing a disinclination to increase levels of domestic farm support. In fact in many countries, the level and effectiveness of current farm support programs is being analyzed, more comprehensively and possibly more critically—in relation to policy objectives—than has been usual in recent years.

Overall, however, unemployment levels, and general social and economic considerations are making it particularly difficult for governments, currently, to contemplate the introduction of measures in the rural sector to implement so-called “positive adjustment policies” which might lead to a reduction in “high cost” production and hopefully to an improved climate for agricultural trade. In the short term, while levels of support are likely to be contained, thus damping down production measures, sluggish demand is likely to ensure that there is no significant increase in intra-OECD trading opportunities, unless occasioned by crop failures or other unpredictable emergency situations.

Outside the OECD area, in the Eastern bloc and in the developing countries, effective import demand is a function of nutritional requirements, the level of domestic production, and the balance of payments, as well as prices—although the relative importance of each of these factors is variable and unpredictable. However, with the exception of the Eastern bloc these non-OECD countries tend to constitute “price-takers” rather than “price-makers,” to the extent that they do in fact operate on the commercial market.

THE WEATHER

On a worldwide basis, climatic conditions in 1978 were exceptionally favorable for most agricultural products, in most significant production regions. In 1979, weather was more “normal” (that is, less favorable than in 1978) over most of the OECD countries. More seriously, severe drought conditions have led to a dramatic decrease in cereals production in the U.S.S.R. (down at least 35 million tons of wheat and 15 million tons of coarse grains) and disappointing harvests in a number of developing countries, particularly in Asia; India is an example.

In looking ahead to 1980, it is probably safest to assume that on a world basis, conditions will be somewhat similar to the relatively “normal” conditions experienced in 1979.

INDIVIDUAL FARMER DECISIONS

Although it is clear that in the longer term farmers' managerial and proprietorial decisions reflect the totality of the economic and social pressures to which they are being subjected, it is probable that in the short term "production" decisions are influenced more by current prices and relative prices of alternative farm products than by prevailing "extension service type wisdom" as to the likely future relative profitability of the products concerned. There are exceptions, like the recent reluctance of Australian and New Zealand beef producers to rebuild herds in response to improved beef prices; but generally, farmers react to current prices. These prices have recently been pretty good for all Temperate Zone farm products, so the probability is that farmers will be looking to maximize production (both acreage and yield) for most crops and animal products over the next growing season—although differing market trends may result in some changes of emphasis in production patterns.

COMMODITY OUTLOOK

With these underlying factors and assumptions in mind, I would summarize our view of the short term outlook situation by saying that supplies of wheat and coarse grains will be heavy in 1979-80; but less than last season, mainly because of a poor harvest in the U.S.S.R. Rice production, however, may decline to some extent. With heavy demand, stocks are expected to decline somewhat, but provided there are not widespread crop failures next season, available supplies should be adequate to ensure world food security.

Record crops of soybeans are expected, and with no reduction in the production of other proteins, supplies of all livestock feeds should be plentiful.

The cattle cycle appears to have turned upward in both North America and Oceania, but herd rebuilding and consequently increases in production are likely to be gradual rather than dramatic. Beef prices will thus remain high, although, in the current economic climate, not rising steeply over the next 12 to 18 months as once seemed likely. Pig meat and poultry supplies should continue to increase in North America. In the EEC, where cyclical movements are less pronounced, no major changes in supplies of the various meats are expected.

In the dairy sector, the surplus stocks of skim milk powder have been eliminated, but milk production is still increasing in the EEC. At its recent "Outlook" meeting, the OECD Committee for Agriculture concluded that in the long term, the only apparent solution to the oversupply problem lay in reducing the volume of milk production in the EEC, with other countries collectively containing production to its current level until the overall surplus within the OECD area was eliminated.

The value of agricultural trade will increase, mainly because of higher prices, although these prices may not result in increases in export earnings in real terms because of the effects on balance of payments of escalating energy costs, exchange rates and other factors. Higher cereal prices, particularly coupled with unfavorable crop conditions, are having an adverse effect on the balance-of-payments situation of a number of developing countries.

At the farm level, costs of production have risen sharply, and generally have not been completely offset by these higher prices for farm products. However, it seems likely that we have reached the stage that retail food prices are likely to be influenced more by increases in marketing costs than by increases in production costs.

I should like now to focus attention on some of the more significant implications of these very general conclusions.

WHAT ARE THE PROSPECTS FOR CEREALS MARKET STABILITY AND WORLD FOOD SECURITY?

With demand outrunning production, and stocks being reduced as a consequence, prices for cereals should remain at a comparatively high level, at least until the size of the 1980 harvest becomes susceptible to credible forecasts. In the short term, the weakness of the dollar, and transport problems are also likely to contribute to firm prices. As a consequence, the prospects at this stage are for record or near-record crops in 1980 if the weather is reasonable. It would appear therefore, that unless catastrophe strikes in the developing world (an example would be two consecutive crop failures in India), stocks are likely to remain high enough (as measured by FAO's criteria) to assure world food security over the next couple of years. Nevertheless it must be noted that the absence of an effective international grains agreement and in particular of coordinated stock policies for market stabilization and food security purposes, suggests that in the medium to longer term, the world supply situation remains vulnerable—particularly while production and stocks are concentrated in a relatively small number of OECD countries.

HOW IS THE MEAT MARKET LIKELY TO EVOLVE?

At the world level, the expected further reduction in beef supplies will be offset to a large extent by sustained higher levels of pig meat and poultry production and marginal increases in sheep meat availability.

It now seems probable that in the expected economic climate, increasing consumer resistance could dampen down the anticipated rise in beef prices. The diversion of demand to the cheaper meats, pig meat and poultry, should ensure that prices for these meats remain firm enough to discourage the declines in production which were being predicted for late 1980 in both North America and Northern Europe, notwithstanding continuing firm prices for animal feedstuffs.

However, the major factors which are likely to dominate the international meat markets in 1980 are the possible level of U.S.S.R. imports, possible changes in the size and the nature of Middle East requirements, of lesser significance, but still important are the possible implications of the proposed revision to the United States import law, and the implications of the proposed EEC common sheep meats regulation. These are all very unpredictable elements at this stage, but my own hunch is that the U.S.S.R. and the Eastern bloc could be looking for further substantial meat imports during 1980. The other elements, in my view, are not likely to have such significance over this period.

IS DAIRY PRODUCTION LIKELY TO BE BROUGHT UNDER CONTROL?

Although in the EEC, production now consistently exceeds domestic consumption, the "surplus" in the rest of the world (measured by the excess of supply over commercial demand at any given time at "world" price levels) is strongly influenced by weather.

There are few countries where total consumption of dairy products can be considered to be buoyant. Although cheese consumption is still increasing almost everywhere, it is generally at a slower rate than in recent years. The United States has reported some increase in per capita butter consumption in 1978, and several EEC countries managed to raise butter consumption last year, mainly as a result of subsidies. However, EEC stocks are continuing to increase. As well as taking measures to encourage farmers to give up milk production, the Community is attempting to deal with its stock situation by subsidizing internal consumption, by food aid donations and by exporting to third markets. Particularly, large sales made recently to the U.S.S.R. may help to bring about a reversal of the upward trend in stocks.

The situation has changed quite markedly for one commodity, however, skim milk powder. Mainly as a result of large subsidies to make this product competitive with soybean meal, but also because of large food aid shipments and other exports, the EEC's surplus stocks have been eliminated. Those of the United States, which were also in surplus, have been brought down to a fairly normal level as a result of the use of this product in domestic programs. A small surplus has appeared in Japan, but this is not large by international standards. Elsewhere stocks are at normal commercial levels. Prices in international trade have firmed as a result of the ending of the overall surplus.

It has been generally accepted within the OECD that in the long run, the solution to the dairy problem lies in reducing the volume of milk production within the EEC while production outside the EEC is contained at its current level—at least until the overall surplus within the OECD area has been eliminated. The real problem, of course, is to find methods of applying effective supply constraints in such a way that rationalization, adaptation, and improving productivity and efficiency will not be jeopardized. There is no easy, and certainly no universal, solution to this particular problem, when political and social considerations are also taken into account.

HOW STABLE ARE FEED LIVESTOCK INTERRELATIONSHIPS?

The grain-oilseed-livestock complex does not seem likely to be characterized by major disturbances in 1980. The expected level of demand for feed grains and oilseeds originating from the livestock sector should be met fairly easily, particularly the demand for proteins for animal feeds. Large imports of feed grains by the U.S.S.R., however, are expected to keep firm, feed grain prices, and in particular corn prices. An increase in the corn-soybean price ratio is likely to occur during the 1978-80 season. Such an increase could have an impact on the allocation of land to the various crops, particularly in the United States, reversing the trend during the last three seasons whereby land has been shifted toward soybeans and away from other crops.

The outlook for plentiful feed grain and oilseed supplies suggests that in the EEC, compound feed prices, after a pronounced rise in some countries, will remain close to current levels or possibly even fall slightly. With pig and poultry prices in the EEC again increasing, this could help to make any reduction in production of these meats of a short-lived nature. In the dairy sector, stable compound feed prices could stimulate consumption of these feeds during the winter period, particularly if adverse weather conditions lead to limited availabilities of roughages. However, structural changes in the North American pig-meat sector would seem to have affected to some extent the supply response of livestock producers, who are now less able to adjust flexibly to changes in the profitability of meat production.

HOW ARE DEVELOPING COUNTRIES LIKELY TO BE AFFECTED?

It seems probable that overall cereal production in the developing countries will decline in 1979, at a time when they will be experiencing increased balance-of-payments difficulties and when international cereal prices are likely to remain at relatively high levels. As a consequence there is little hope for any immediate widespread improvements in nutrition in these countries. In the short term, stocks should be sufficient to permit the maintenance of food aid programs to the poorest countries, but there is a need, recognized by the OECD member countries, to seek more permanent solutions to the economic and nutritional implications of food shortages through the development of food security programs and giving priority to domestic food production projects at the national level in developing countries.

It is, of course, important to note that the rates of growth of developing countries differ from one another, and as a result their economic situations are becoming increasingly diversified. While up to now commercial demand for imports has generally been restricted to cereals, there are indications of an emerging demand in some developing countries for other products, including soybeans and dairy products, and in some instances, meat.

CONCLUSION

Looked at from the point of view of the OECD countries as a group, there appear to be good prospects for an expansion in overall export earnings from Temperate Zone agricultural products over the next 12 to 18 months, although there will inevitably be differences from product to product and country to country. However, the balance-of-payments effects of these improvements in the earnings of the exporting countries will be offset, and could even be negated in some cases, by escalating import costs, particularly, of course, for oil and oil-based products. The importing countries will be hit twice by the higher prices for agricultural commodities as well as by import pressures in the nonagricultural sector. Changes in exchange rates could be a further complicating factor.

Nevertheless as seen from this point in time, 1980 should be a year in which the balance of interests between our producers and our consumers, will be struck at a level which is as reasonable to both, as other circumstances will allow.

Looking further ahead both the world food security situation, and the vigor and responsiveness of the world commodity market (and ultimately the interests of both consumers and producers) will depend on how governments, both at national and at international level, tackle the major issues of protectionism, coordination of production, consumption and trade policies, and international cooperation to stabilize markets while still assuring adequate supplies. It will be the national and international response to these issues which, more than anything else, will determine whether food supplies and food demands will be balanced during the 1980's in a manner which is fair to consumers and producers and between exporting and importing countries.

AGRICULTURAL OUTLOOK



FOOD PRICES IN 1980

(By Kenneth R. Farrell, Administrator, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

Persistent inflation continues to be the major economic concern of the Nation. And, the most visible of the price rises continue to be in the energy, food, and transportation sectors. Retail food prices this year, will average nearly 11 percent higher than in 1978, about the same as the general rate of inflation. Those increases follow a 10-percent rise in food prices and a 7.7-percent inflation in the overall economy in 1978.

Most forecasters expect the general rate of inflation to be around 10 percent for 1980. If this forecast is accurate, increases in food marketing costs alone imply significant increases in food prices next year. However, if 1980 farm price increases are moderate, as expected, the total increase in food prices could well be below the overall rate of inflation. Current information and commodity forecasts underscore that possibility.

Any realistic food price forecast has to start with what is known about fundamental supply and demand conditions and then try to take into account the uncertainties and the likely directions of their net impact. For 1980, the fundamentals suggest that food prices might increase about 8 percent. Even so, the likely impacts of the uncertainties are skewed toward higher rather than lower food prices. It is difficult to foresee circumstances that would make the outcome more than a percent or so lower than 8 percent. But an accumulation of largely unforeseen individual phenomena could easily add 2 to 3 percent to the base forecast. A range of 7 to 11 percent would appear to capture most of these uncertainties.

The quarterly pattern of food price increases next year is expected to differ from that of 1978 and 1979. Moderate food price increases are expected early in 1980 due to larger supplies of pork and poultry, as well as some slackening in demand as the economy slows. More rapid price increases in the second half of 1980 may occur as the economy recovers and meat output declines.

FOOD PRICES AND INFLATION

Price movements in the food sector are often discussed separately from the state of the economy and the general inflation rate. However, the general economy determines the environment in which the food sector operates, and general inflation is a contributing factor to increases in food prices. Costs of production at the farm level as well as costs of processing and distributing farm food commodities both change roughly in line with the general inflation rate. In addition, the strength or weakness of the economy can change supply and demand

conditions by affecting production and consumption decisions in the food sector.

The close, positive relationship between inflation in the general economy and inflation in the food sector is evident over the past three decades. In the 1950's, inflation in the general economy and in the food sector both averaged about 2 percent. In the 1960's, both also rose about 2 percent. In the 1970's, although general inflation varied widely, it has averaged 7 percent while food inflation has averaged 8 percent.

The most commonly used and closely watched indicator of overall retail prices is the Consumer Price Index for all urban consumers (CPI-U). Compiled monthly by the Bureau of Labor Statistics (BLS), retail prices are surveyed nationwide for a fixed basket of consumer goods and services. Indexes representing these prices are reported and weighted aggregates are computed for major goods and services categories. Changes in the CPI can be used as an indicator of the general inflation rate and, in fact, this is the most commonly used inflation measure.

Currently, the relative importance of food in the CPI-U is 18.2 percent. This means that almost one-fifth of consumer expenditures on goods and services is spent for food. Food is the second most important category of consumer expenditures behind housing (44.3 percent) and slightly ahead of transportation (17.8 percent).

Expenditures for food at home account for 69 percent of all food expenditures, with the remaining 31 percent being accounted for by food expenditures away from home. In food expenditures at home, meat is the most important category (26 percent) followed by fruits and vegetables (14 percent), dairy products (13 percent), and cereals and bakery products (12 percent).

1979 FOOD PRICES IN REVIEW

Food prices for 1979, including both at home and away from home, will average about 11 percent higher than in 1978. The farm value of the market basket of domestically produced farm foods will average about 12 percent above last year and account for about 40 percent of the yearly increase in grocery store prices (food at home). The farm to retail price spread, a measure of processing and marketing costs, also will average about 12 percent higher, accounting for about 50 percent of the rise. Prices for fish and imported foods will be about 6 percent higher, accounting for the remaining 10 percent of the increase in 1979. Food away from home prices will average 11 percent higher than in 1978.

First quarter prices rise rapidly

The most rapid food price increases this year occurred in the first quarter, rising at a seasonally adjusted annual rate of 17.7 percent. Higher prices were recorded for almost all major food groups, with the largest increases being for meats and fresh fruits and vegetables. Large increases in farm commodity prices were the primary cause of these price rises.

Retail prices for meats increased 51.5 percent in the first quarter, led by an 87.6-percent increase in beef and veal prices. These price increases reflected a 9-percent decline in beef production in the first quarter compared to year earlier levels as well as transportation problems in the Midwest due to harsh weather. Prices for fresh fruits and vegeta-

bles increased 20.2 percent. These increases partly resulted from cold weather in the Southwest which damaged the citrus crop, as well as labor strife in California which disrupted lettuce harvesting.

Second and third quarter prices moderate

Retail food price rises in the second and third quarters moderated significantly from the rapid first quarter increases. The CPI for food in April through June slowed to a 7.5-percent annual rate of increase, while in the third quarter the increase was only 4.2 percent.

Increases in marketing costs, rather than commodity prices, were the primary sources of increase in the second and third quarters. The farm value of the market basket fell in both the second and third quarters, but increases in farm-to-retail price spreads more than offset farm value declines.

Meat and poultry prices generally declined from June through August, rose some in September but remained below their June levels. Continuing higher production of both pork and poultry coupled with temporary increases in beef production were primarily responsible for price declines through August.

Cereals and bakery products prices rose 3.2 percent during the third quarter. These changes were partly a result of higher flour prices early in the quarter. However, changes in marketing costs were also an important factor.

Fresh fruit prices, primarily for apples, rose through August before the autumn production began to affect the retail markets. Coffee prices began to increase in the third quarter for the first time since the middle of 1977, a result of the early June freeze in Brazil.

Fourth quarter price increases to remain moderate

Food price increases in the fourth quarter are expected to be moderate. Retail pork and poultry prices will fall through the quarter. While beef supplies are expected to be lower, large supplies of both pork and poultry will moderate any beef price increases.

Prices of dairy products will likely rise during the fourth quarter, but not as much as in late 1978. Dairy product supplies during the rest of 1979 are expected to be up slightly from a year earlier.

Retail prices for cereals and bakery products are expected to increase at about the rate of inflation in the general economy. Increases in marketing costs, rather than food grain prices, will be the primary sources of these retail increases. The strong export demand for grains will affect these prices only minimally. Domestic production and stocks are both large. Also, the farm value of these products accounts for less than one-fifth of the final retail price.

Prices for fresh vegetables will rise seasonally during the fourth quarter, but are expected to remain below the high level of the first quarter. Potato prices will likely exceed year-earlier levels. Fresh fruit prices are expected to decline seasonally through the remainder of the year. Total noncitrus production will be about 5 percent higher than in 1978 with record crops expected for sweet cherries, grapes, and nectarines and a near-record crop expected for apples. In addition, a larger citrus crop is expected next year.

1980 OUTLOOK

As indicated at the outset we expect retail food prices in 1980 to average 7 to 11 percent above 1979. And we expect the quarterly pat-

tern of price changes to differ significantly from that of 1979. About 6 percent of the expected increase in the retail price of food at home will derive from increases in the farm value of the foods; 74 percent is expected to result from increases in costs of marketing food; and about 20 percent will be traceable to increases in the prices of fish and imported foods. Let's look at each component in some detail.

Farm value of domestically produced food

The outlook for principal food commodities has been discussed in detail in other sections of the conference. Briefly, the highlights of that outlook are:

Red meats and poultry.—Farm-level livestock and poultry prices are not expected to rise in 1980. Some further increase in cattle prices likely will be offset by lower prices for hogs and broilers. Pork production will be record large in 1980 but broiler output is expected to turn lower by mid-year. Beef production next year may be only marginally higher than 1979.

Dairy and eggs.—Milk production in 1980 is expected to exceed 1979 by about 1 percent and prices may rise by 10 percent. Egg production may be slightly higher in early 1980 but large supplies of other protein foods may hold egg prices below 1979 levels.

Fruits and vegetables.—The 1979 crop of fresh vegetables will be up 3 to 4 percent this year. The canned and frozen vegetables supply may be up 6 to 7 percent. In response to larger supplies, prices to growers are expected to remain below this year's level. The new citrus crop is expected to be record large, up 15 percent from last year. This will hold citrus prices down next year, especially for oranges.

Cereals and bakery products.—Food grain production is large this year but strong export demand will push prices higher. This year's wheat crop is up 18 percent and rice production is record large. Wheat and rice prices are expected to average higher in 1980 than in 1979.

Fats and oils.—This year's record large soybean crop is up 18 percent from last year. Demand for exports is also up but not as much as the supply. As a result, soybean prices are expected to average lower next year. Peanut production will be up about 3 percent this year and the sunflower crop is twice as large as last year.

Sugars and sweeteners.—Sugar beet production this year will likely be down about 13 percent from last year but U.S. sugarcane production will be larger. World sugar supplies are tight and increases in world prices are likely to push domestic prices up.

Combining and weighting these diverse commodities into our market basket suggests that with no serious weather-related problems the farm value of the market basket may average only moderately higher (1 percent) than in 1979. But, as has been demonstrated in recent years—most recently the last two winters—weather conditions can disrupt production of important farm food commodities and significantly alter the pattern and level of retail food prices. Such potential instability is heightened by the close linkage of our domestic food system with world markets which themselves are subject to weather-related instability. Allowing for the possibility of serious weather problems in some part of the country during the year, a prudent forecast would range from no change to a 10-percent increase in the farm value of the

market basket in 1980 despite expected large supplies of commodities in the first half of the year.

Our "favorable weather" forecast of 1-percent increase in farm value, if realized, is in sharp contrast to the double digit percentage increases in 1978 and 1979. If realized, the farm value will be the primary moderating effect for retail food price changes next year. However, as the asymmetry in the forecast range for the farm value change implies, the price implications of these weather related uncertainties are more likely to push prices higher rather than lower. Supplies of fruits, vegetables, the summer crops, and even meats could be effected by weather. The actions of pork and poultry producers are of particular importance here.

Marketing costs for domestically produced food

Food processing and marketing costs are the major component of retail food prices, accounting for about 60 percent of the retail product value. This, of course, varies among products. For once, such as cereals and bakery products, these costs account for over 80 percent of the final retail price. For another, namely eggs, it is as low as 35 percent.

The farm to retail price spread, calculated from the USDA market basket statistics, is a measure of food processing and marketing costs. These costs, arising from the nonfarm sectors, closely parallel the rate of inflation. In 1980 these costs are expected to rise 9 to 12 percent, with the current assessment of 10 percent in line with the expected general rate of inflation.

Labor costs, the largest component of marketing costs (46 percent), are expected to rise almost 10 percent due to higher wages, increased employee benefits, and small productivity gains. The large increase in the CPI this year has intensified pressure for larger wage increases in the future. Unions representing 300,000 food industry employees will negotiate contracts in 1980 and will probably insist on substantial catch-up raises. Additional raises are assured for workers who have semi-annual cost of living adjustment clauses in their contracts. Also, some workers will benefit from the increase in the minimum wage from the present \$2.90 per hour to \$3.10 on January 1, 1980.

Employee benefits—including paid vacations and holidays, health insurance, private pensions, and employer payments for social security and unemployment insurance—have generally increased more rapidly than hourly earnings. In contract negotiations, employees have insisted on more and better fringe benefits—which are not subject to income taxes—rather than wage increases. To maintain the purchasing power of pensions for retirees and to maintain existing benefits for workers, the cost to the employer will rise with the general inflation rate.

The cost of packaging materials (12 percent of marketing costs) is expected to increase 9 to 10 percent in 1980, down from this year's 11 percent increase. Plastic packaging materials will cost more next year, reflecting higher petroleum prices. The cost of glass containers and paper packaging materials will also increase, but less than the general inflation rate.

Food transportation costs (8 percent of marketing costs) are expected to increase 10 to 11 percent, reflecting higher rail and truck freight rates. General rate hikes and fuel surcharges imposed in response to higher energy costs this year will continue next year. Higher energy costs will also effect retail store operators and food manufac-

turers. The costs of lighting, heating, cooling, and processing foods will rise substantially because of higher prices for electricity and natural gas.

CONTRIBUTION TO INCREASES IN FOOD PRICES

[In percent]

	1974	1975	1976	1977	1978	1979 ¹	1980 ¹
Farm value.....	2.7	1.8	-1.6	0.1	5.1	3.8	0.4
Fish and imports.....	2.5	1.9	1.2	4.1	1.3	1.2	1.6
Marketing costs.....	9.7	4.6	2.5	1.8	4.1	6.0	6.0
Total change.....	14.9	8.3	2.1	6.0	10.5	11.0	8.0

¹ Forecast.

COMPONENTS OF FARM FOOD EXPENDITURES



1978 data

CHANGES IN THE CPI FOR FOOD: 1978, 1979, AND FORECASTS FOR 1980

[In percent]

Component	Relative importance (1979)	Change in—		
		1978	1979	1980
Food.....	100.0	10.0	11.0	8.0
Food away from home.....	30.4	9.0	11.3	9.7
Food at home.....	69.6	10.5	10.8	6.8
Cereals and bakery products.....	8.5	8.9	9.8	8.9
Beef and veal.....	9.3	22.9	27.9	8.2
Pork.....	5.6	12.9	1.5	-5.6
Other meats.....	3.0	17.8	14.6	4.5
Poultry.....	2.5	10.3	4.7	-6
Fish and seafood.....	2.3	9.5	9.8	9.2
Eggs.....	1.4	-5.5	9.4	-1.3
Dairy products.....	9.3	6.7	11.1	9.2
Fresh fruits.....	2.4	19.4	14.1	7.3
Fresh vegetables.....	2.5	7.9	2.9	8.4
Processed fruits and vegetables.....	4.8	10.5	9.0	8.2
Sugar and sweets.....	2.4	12.2	8.1	8.0
Fats and oils.....	2.0	9.5	8.0	7.4
Nonalcoholic beverages.....	7.8	5.7	4.7	7.9
Other prepared foods.....	5.8	8.0	10.2	9.2

Profits in the food industry are expected to decline slightly in 1980, especially if there is a slowdown in economic activity. Food manufacturers' profits are likely to decline most, while increased competition from discount and volume food stores is expected to have a negative impact on food retailing profits.

A decline in profits for food retailers in 1980 would follow 2 years of increasing profits. In 1978, food retailing profits increased more than 30 percent. This year, food retailing profits are expected to increase about 13 percent. In both 1978 and 1979, after tax earnings to sales ratios in food retailing have averaged about 0.9 percent—the highest in recent years.

Fish and imported foods

The fish catch in 1979 was up substantially, stimulated in part by high prices for other meats. The outlook for 1980 is for another large catch. Per capita consumption of fish and seafood has been increasing gradually in recent years reflecting increased demand. For this reason, with increased supplies in 1980, fish and seafood prices are expected to rise about 9 percent.

Coffee production is not expected to increase substantially, mostly because a freeze in Brazil damaged the 1980 crop. Coffee prices have increased since last summer as a result of the freeze and are expected to continue increasing through 1980. This reverses a downward trend in coffee prices dating back to 1977.

Retail food prices

Expected changes in farm level commodity prices, along with increases in marketing costs, are the basis of our retail price forecasts for major food groups. In 1980, beef and veal prices are expected to rise 8.2 percent, pork prices should decline 5.6 percent, and poultry prices are expected to fall 0.6 percent at retail. Egg prices are forecast to decline 1.3 percent. These changes are largely a consequence of developments at the farm level.

Dairy product prices are expected to increase 9.2 percent in 1980. In addition, higher marketing costs should result in an 8.9 percent in-

crease in retail prices for cereal and bakery products, an 8.2-percent increase in retail prices for processed fruits and vegetables, and a 7.4-percent increase in fats and oils prices. Sugar and sweets prices should increase about 8 percent.

SUMMARY

Changes in the farm value in 1980 are expected to be much more moderate than in 1978 and 1979. Record supplies of many fruits, vegetables, and summer field crops will be plentiful. Barring any weather related supply disruptions, the farm value next year could average 1 percent more than in 1979. But as has occurred frequently in past years, weather could present some problems and cause the farm value to rise as much as 10 percent in 1980.

Marketing costs are expected to rise 9 to 12 percent. Labor costs, the largest component of marketing costs, are expected to rise 10 to 11 percent. Packaging costs, transportation rates, and energy prices will also be higher. Profits will increase, but not as much as in 1979.

These expectations imply an aggregate increase of about 8 percent in retail food prices in 1980. Higher prices for fish and imported foods will be a significant source of increase, but higher food marketing costs for domestically produced food will be the principal cause. This outlook contrasts with the experience in recent years when higher farm prices played a major role in pushing up consumer food prices.

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FOOD PRICES IN 1980: DISCUSSION

(By Doyle A. Eiler, Director of Research, Food Marketing Institute)

I would like to commend Dr. Farrell on his careful analysis of our current food situation. While we all might wish he could provide a definitive single estimate for next year's food inflation, the uncertainties of the economic, agricultural and political situations are just too great.

It takes courage to resist the political and media pressure for a single definitive number and we congratulate Dr. Farrell for his fortitude.

Although I must admit I am intrigued by the number the USDA has selected. Seven and eleven sounds Las Vegas to me but with the international situation today, maybe we really are rolling the dice for next year.

Perhaps the roll of the political dice has something to say about our domestic economic policy as well. Food prices cannot be considered in isolation from the political pressures they generate and I would like to turn to that topic for a moment.

With the prospect of continuing high inflation, I am concerned that short term political considerations have become the overriding focus of our economic policy. There is no disagreement that inflation is our primary economic problems but its solution requires long-term adjustments.

Last fall, in an effort to interrupt the self-perpetuating cycle of inflationary expectations, a voluntary wage-price guideline program was established to provide a moderating climate which would nurture the price decelerating effect of appropriate long-term adjustments in monetary and fiscal policy.

No matter how noble its intent, a guideline program can only be effective for a short period of time. By its very nature, a guideline program attempts to maintain the status quo. While the status quo may be politically desirable, we have seen with the recent increases in international oil prices that it is economically impossible.

Just because there is no simple economic solution to inflation does not eliminate the need for political solution. As an example of a politically motivated solution to inflation, pressure is now developing at the White House and within the Council on Wage and Price Stability to require food retailers to selectively post historic prices in their stores. The intent of this cosmetic program would be to demonstrate that the government is doing something about inflation but what is its real impact.

Just as cattlemen can't buy feed at last year's prices, neither can consumers buy hamburger at last year's prices. With farm prices outside the guideline program, as they should and must be, prices of individual agricultural products at retail are not the proper focus for

public attention. The control program for food distributors is extremely complex—complex beyond the reach for a single price posting number. Historic price data does not even make a significant contribution to helping consumers make informed choices among their current shopping alternatives.

The selective posting of historic prices has the potential for seriously distorting the pricing signals so important to encouraging the supply response of producers. We only need look at the reaction of beef producers during the price freeze of the early 1970's to see the important role price plays in their decision process. If a shortage causes an upward pressure on price, artificially dampening price movement doesn't encourage the natural price moderating force of increased production to occur.

In our current inflationary environment, food retailers are in the unfortunate situation of being bearers of bad tidings. No matter what its source, inflation is noticed by the consumer when they pay their hard earned dollars for fewer and fewer bags of groceries. Grocery store inflation is more noticeable to consumers because of the frequency of cash purchases. While food inflation may be more easily noticed by consumers, Dr. Farrell appropriately points out that in the long run food closely parallels inflation in the general economy. Thus any effort to heal the diseases of inflation must move beyond temporary measures to reduce the patient's fever as reflected in food store prices.

With the high visibility of food inflation, we all are frequently asked to comment on food prices and their impact on the cost of living. As economists, when you and I are asked "what has happened to the cost of living" we usually refer to the Consumer Price Index (CPI) which is published monthly by the Bureau of Labor Statistics (BLS). In doing so, we frequently slide over a subtle, yet, important technical point which is particularly significant in examining food price inflation. The CPI is not a cost of living index but rather a fixed weight index. In many areas this distinction may not be important but it is for food.

Of all major consumer expenditure categories, food provides the greatest opportunity for product substitution in response to changing relative prices. It is recognized that if the price of chicken drops relative to hamburger, consumers will shift their purchase from hamburger to chicken. In fact, this is the most important way for individual consumers to cope with inflation. Yet this constantly changing mix of actual food purchases is not picked up by the CPI.

This does not mean that the CPI is not a good fixed weight price index; rather, it illustrates the inappropriateness of using the food component of CPI, as a cost of eating indicator. By its very nature, the CPI overstates the actual increase in the consumers cost of eating.

To illustrate the effect product substitution can have on the cost of eating, I would like to cite some actual retail food store data. As part of their retail accounting program some retailers collect information on the average per case retail value of merchandising moving through their store. This per case value can be used as an index of the price consumers are paying for the goods actually purchased. As consumers substitute one product for another, it is reflected in average per case value.

In the market where this company operates, the CPI food at home index increased 9.2 percent between September 1978 and September 1979, but the average value per case for all food commodities increased only 8.5 percent. This 0.7 percentage point difference is indicative of the tendency of CPI to overstate actual increases in eating costs. During a period of stable relative prices this distinction is unimportant but in periods of rapid price increases in one or two commodities we should avoid overlooking the impact rational consumer behavior has on the cost of eating.

It is very easy to slip from technically correct interpretation of CPI as a price index into using it as a cost of living index which it is not. Dr. Farrell, in his paper, was most careful to avoid this trap and I am encouraged that the USDA acknowledges the problems associated with misinterpretations of fixed weight indexes. Negotiators of cost of living accelerator clauses in various contracts have not been as careful.

1980 FOOD PRICE OUTLOOK: A CONSUMER RESPONSE

(By Ellen Haas, Community Nutrition Institute)

It seems, these days, that no one ever has any good news anymore—especially when it comes to economics. Anyone who reads a newspaper or who watches Walter Cronkite will tell you that the economic health of our Nation is in pretty bad shape. Uncle Sam is overextended, heavily in debt, and eating spaghetti instead of steak.

It is fashionable today to attach blame for our problems with inflation to “excess demand” or “too many dollars chasing too few goods.” But those who subscribe only to this theory are overlooking two extremely important parts of the inflation picture.

First, what has been the effect of inflation on the poor in this society—on that group of consumers living in families with only one income, who cannot get credit, and who have no choice but to pay higher and higher prices for essential products out of largely fixed incomes. This group only feels the effects of inflation, it contributes little or nothing to its causes.

Second, the effects of market power inflation are overlooked. Although this branch of inflation includes the price-pushing stimuli generated by firms operating in an oligopolistic fashion, it also includes the inflation derived from scarcities of raw material inputs and labor cost increases which outstep increases in productivity.

The first of these overlooked points lends great need to solving the great inflation problem, the second provides at least some vehicles through which this goal can be achieved.

INFLATION HURTS THE POOR MOST

When the cost of heating fuel and gasoline rises 60 percent in the space of a year, at the same time food prices rise by nearly 12 percent, what can the poor of this Nation possibly do? Already the poorest family out of every five is forced to spend close to 40 percent of disposable personal income on food purchases. Can we logically expect that they will be able to boost spending by 12 to 15 percent every year? The virtual impossibility of this happening lends great urgency to finding solutions to the inflation problems at hand because when prices of essential foodstuffs rise to the extent that some people can no longer afford to purchase the foods necessary for a nutritionally adequate diet, individual health and well-being become endangered.

This scenario is intensified by the alarming fact that while food costs as a percentage of spendable consumer income are declining for 80 percent of the population, they are actually increasing for the poorest family out of five. Unfortunately this has come despite the contribution of food stamps to the food-buying potential of the poor.

STRUCTURAL CAUSES OF FOOD PRICE INFLATION

If these are the most critical effects, what have been the causes of food price inflation? Why has this been such a critical concern in the 1970's?

Between 1970 and 1979, food prices will have nearly doubled—rising approximately 93 percent. Sixty-four percent of that increase will have been the result of cost increases in the marketing sector. Of the 32 percent attributable to the farm sector, nearly a third occurred in 1 year—1973—and another 40 percent will have come in 1978 and 1979. Thus the pattern is clear. Food price inflation has been the result of periodic jolts to the food economy delivered by the farm sector and, more importantly, to a pervasive and continuing growth in the costs of processing, transportation, packaging, and marketing.

THE PRODUCTION SECTOR

The great American food machine, once thought to be the invincible source of stability to the world, is entering a new age of vulnerability. Without fundamental changes in U.S. grain supply management policy, increasing population and affluence abroad will steadily pull U.S. food prices upward, with the additional possibility of severe jolts brought by crop failures. These jolts will ricochet throughout the food economy as before and then ratchet all consumer prices upward. Farmers will borrow to purchase land and machinery to increase production and then be overextended when farm prices fall.

The United States urgently needs a prudent grain resource management strategy. We are entering a period where the pull of global demand, rather than the push of domestic supply, will dominate the world's food economy. We must develop a strategy that would introduce stability to the grain markets—stability of prices and supplies for American consumers and for the needy in the world today.

There are a number of possible strategies being developed today that would attempt to accomplish this goal. One centers around a National Grain Board approach with price stability as a principal operating objective. Another makes use of "World and U.S. Food Reserve Boards" which are also directly involved in the grain and essential foodstuffs markets. We must explore such strategies and develop a plan for actively managing our food production resources. The investment of time today will pay off in a less volatile food price scenario in the coming decade and beyond.

THE MARKETING SECTOR

The growth in food marketing margins over the last decade is not attributable only to increases in the costs that actually comprise the marketing bill. A significant contribution has been made by the tremendous shift in consumer demand which has occurred over the last 20 years. Generally, consumers today are spending a far greater percentage of the food dollar on prepackaged, prepared, and virtually predigested convenience foods rather than on minimally processed farm commodities. Consumers are also eating a far greater proportion of their meals in restaurants. These types of foods are far more dependent upon labor, packaging and energy costs and, as can be expected, experience a steady inflation in price as a result.

With respect to cost increases for processors and retailers, there is no question but that it simply costs more today to bring lettuce from California to Boston or that keeping a store at 62° F. during the summer is getting more expensive. But what is in dispute is whether the higher prices consumers are paying at the checkout counter reflect only those cost increases or widening profit margins as well.

In fact, USDA and the Council on Wage and Price Stability reported that during the period of September, 1978 to May, 1979 food processing and marketing costs rose 7.4 percent while farm to retail spreads rose 10 percent. For these 6 months alone this discrepancy amounts to billions of dollars disappearing into the depths of the food industry.

But just where has this excess gone? With respect to beef prices in particular, USDA concluded in its June pricing study that "the behavior of beef price spreads since fall of 1978 has been atypical. Rather than spreads being squeezed while farm prices were rising rapidly, they actually increased significantly. Implications are that profits on meat processing and distribution have increased substantially and are a substantial contributor to the high level of food prices being paid by consumers."

Profit data for the entire industry, in fact, sheds light on the final resting place for much of the pricing excess. During 1978, General Foods recorded a 41-percent increase in profits on a 5-percent increase in sales. Quaker Oats reported a 36-percent earnings rise on an 11-percent sales increase. And food retailing corporations Safeway and Kroger recorded profit increases in excess of 40 percent over 1977 levels, while aggregate food retailing profits rose 29 percent. I know that the standard response to this data is that the industry was recovering profit levels after a bad year. But I don't see that that makes much difference. How can we possibly justify such a generous recovery when consumers everywhere are tightening belts? Unfortunately this highlights the unequal distribution of sacrifice which market power allows when inflation intensifies.

CAN ANYTHING BE DONE?

Ken Farrell has talked about each of the food system subsectors and developed an inflation projection for the coming year. While it is clear that a number of largely uncontrollable factors influence the 7 percent to 11 percent projection that he offers, it seems clear to me that there are some places where we can stop unnecessary food price inflation. To begin doing so, I believe is the challenge of this conference.

Two recent actions illustrate the underestimated power over inflation that we do currently possess. The recent defeat in Congress of the sugar bill and the preliminary finding by the Treasury Department that Mexican produce growers are not "dumping" vegetables on the U.S. market both were prudent and forceful anti-inflationary moves. The two steps combined will save consumers hundreds of millions of dollars in food costs over the coming years.

Other actions could be expected to have similar impact.

First, Congress can turn back pending milk support price legislation unless the administration's trigger mechanism is incorporated into that bill. Over the last 4 months milk production had ballooned—climaxing (thus far) in a 3 percent increase in September over year-earlier levels. Milk cow productivity is on the rise and pasture conditions are optimal—indicating that production will climb for some

time to come. When combined with the fact that consumption can be expected to decline due to the recession and to stabilizing prices for substitute protein foods, it becomes clear that the dairy support program could very quickly become extremely expensive. The trigger mechanism will allow USDA the flexibility to postpone part of the semi-annual price increase in the event that Government stocks become burdensome. It is an extremely necessary anti-inflationary tool.

In the longer run, USDA should move to eliminate the restrictive regulations on reconstituted milk which effectively tax that product off the market. This beverage could provide all of the nutritional advantages of a wholesome dairy product at a reduced cost—which would be of particular significance to the low income consumer.

The Department of Agriculture must expand its experimental computerized meat-marketing program and speed its adoption by the meat industry. The current systems of marketing, which center around the use of the Yellow Sheet, are vulnerable to much abuse and manipulation and as such are extremely inflationary. Representative Neal Smith of Iowa has estimated that there is 25 cents in the price of a pound of beef that cannot be accounted for by pure cost factors. USDA has documented the fact that during the summer of 1979, beef prices were about 15 cents per pound higher and pork prices about 9 cents per pound higher than could be justified.

We can actively pursue a strategy for planning and distributing critical food grain resources. The objective of such a strategy would be to gain a large measure of price and supply stability for domestic users and for a U.S. contribution to global emergency stockpiles. It would be designed to prevent the kind of food price inflation disaster which occurred in 1972 and 1973 and would add a good dose of certainty to the new precarious grain supply scenario (and resulting meat outlook) we face for 1980.

Increased funding should be made available as seed money for farmer-to-consumer direct markets and for consumer food cooperatives. Such marketing vehicles effectively eliminate much of the unnecessary middle costs of packaging, advertising, and the like and encourage the local farm economy.

USDA and other Federal agencies should work with local groups to develop food price monitoring programs which could be used to gather and compare retail food price information between stores. Such a consumer monitoring program would enhance the amount of price information in the marketplace and would thus provide a tool with which lower-price independents and box stores could compete more effectively with chains that may dominate the local market.

CONCLUSION

In sum, while there clearly are many unavoidable factors which will aggravate food price inflation next year, there are steps that can be taken that will moderate these influences to a good extent. Some of these steps will have an almost immediate payoff to the consumer; others will allow the structure of a more stable food supply over the long run. Clearly we should not waste time wringing our hands; rather we should get busy and mold the type of cost-efficient system which will provide price stability and supply security for the coming decade.

HOW RETAILERS CAN HELP CONSUMERS COPE WITH INFLATION

(By Odonna Mathews, Consumer Adviser to Giant Food Inc.)

Good morning. I'm very pleased to be here today to discuss food prices from my perspective as consumer adviser to a regional supermarket chain. I will illustrate how Giant Food responds to the consumer concerns about rising food costs and nutrition. For several years now we have been trying to develop the most effective ways to provide consumers with practical information. It has taken us a while to get here, but I think we are on the right track.

Before I get into specifics, let me give you some background on Giant Food. As a regional supermarket chain, Giant has a total of 118 stores in Maryland, Virginia, and the District of Columbia. Sales in 1979 were just over \$1 billion, making Giant the 17th largest supermarket chain in the United States in terms of sales. Giant established a formal consumer affairs department almost 10 years ago responsible for anticipating and identifying consumer concerns to Giant management (we report directly to the President), and for developing corporate consumer programs designed to meet those concerns.

When we first began distributing consumer education materials in the stores, we developed comprehensive booklets that included everything you'd want to know about meat, seafood, and poultry. The booklets were loaded with information—too much information. More recently we have learned that short, simple and practical information is the best way to help the majority of consumers. So over the past 2 years, we have concentrated on effective ways to arm consumers with inflation fighting information and health tips. Many of our education programs are the result of suggestions we have received from consumers and consumer advocates, many of which have turned out to be beneficial not only to consumers, but to Giant as well. Let me give you a few examples.

Our consumer advisory committees, which are composed of individual consumers, representatives of consumer organizations and community groups, tell us that they want practical information about food prices. They want to know when something is a relatively good buy, or a bad buy. They want recipes and preparation tips to make the best use of these good buys, and they want economical alternatives to the higher priced products.

But even though we provide this type of information, consumers tell us that they are often confused, frustrated, and sometimes angry when they see prices go up from week to week. In general, we have found that consumers have a better understanding about the causes of inflation than they did several years ago. But because food pricing is such a complex topic and one that is influenced by many factors, consumers still

have difficulty understanding the total picture—how all the contributing factors (labor, energy, marketing and packaging costs) determine what they pay for a product. When consumers hear that we've had a record wheat crop, they don't necessarily understand that prices may still continue to rise because more may be exported and marketing costs are increasing.

Consumers also tell us that they can't easily use percentage predictions for food price increases, much of which is provided by the Federal Government. The problem with much of the food price information that is available is that percentages, averages, and predictions do not easily translate into weekly food menus, shopping lists or recipes using the more economical foods. The food industry and Government must do a better job of explaining food price information and translating it into practical information that consumers can use. The recent USDA publication, *FOOD*, is an example of a very positive change in Government information that consumers and retailers welcome. In fact, Giant plans to use much of this information in our consumer materials, and of course, credit USDA.

Here are some examples of how we are trying to give consumers the type of information they are seeking.

A year ago April, when wholesale costs of beef began to rise so dramatically, we posted a sign in our stores explaining why beef prices were going up. At the same time we also started to provide economical protein-stretching recipes in our weekly newspaper advertisements. The recipes are a regular part of Giant's ad. Our nutritionist develops them to be low in cost and at least one ingredient in each recipe is on sale that week. The recipes are also designed to be low in calories, fat, salt and sugar. The cost and calories per serving are stated in the ad along with serving suggestions for a well balanced meal. The costs usually range from 25 cents to 90 cents per serving.

I should mention that we have temporarily discontinued these recipes for a few weeks because of a new ad campaign featuring price reductions for many products. But, we've received a very positive response to these recipes from consumers, weight watchers and professionals.

We will soon publish a consumer guide called *Eating Right When the Budget's Tight* which will contain the most popular recipes from these ads, as well as money stretching ideas and food storage information. The idea for a recipe guide actually came from consumers who lost or misplaced recipes from the newspaper ads. They suggested we choose the best and publish a booklet to be distributed in the stores.

Our newspaper ads also give a money saving shopping tip of the week—tips such as buying a whole block of cheese and grating or shredding it yourself, or how to get the most poultry for your money, or how to make your own convenience foods.

A monthly flier, called *Thumbs Up* gives consumers information on predictions of what will be high and low in price for that month, recipes, and shopping tips. The original idea for this publication came from the White House National Consumer Buying Alert, a major portion of which I understand is provided by USDA. We use Government and industry materials, as well as predictions from our own buyers, as the basis for the flier. We include suggestions and illustrations on how to cut up a whole chicken or how to bone a chicken breast to save money, seasonal themes like back-to-school snacks and Thanks-

giving, and comparisons of basic convenience foods. For example, a look at the different types of rice available shows that costs can vary from 2 to 32 cents per serving. Consumers have told us to make Thumbs Up simple and practical, and we are still experimenting with how best to do that. We did survey some customers to find out what they liked best about Thumbs Up. Again, we learned that the recipes were found to be the most useful, rather than predictions of product availability.

Sixty second consumer radio spots encourage consumers to look for our Thumbs Up fliers and recipes in the ads. They discuss unit pricing, store brands, good buys, nutrition and health. About 25 percent of Giant's radio advertising is devoted to consumer messages and we are able to reach many consumers in this way.

Let me interject a word about coupons here since they are certainly perceived by many as a money saving tool. The growing publicity surrounding the use of coupons may be seen as evidence of the consumer's concern with rising prices.

Yet, coupons are a nuisance to many. Some feel they are discriminatory since they are only offered to certain consumers through certain sources. And they are a source of many types of fraud currently being investigated by the U.S. Postal Service. Overall the redemption rate averages about 5 percent, so most consumers are paying for benefits and price reductions that they do not receive. In addition, the retailer's cost of handling which exceeds what they are reimbursed by the manufacturer, is passed on to all consumers. If coupons were eliminated by manufacturers, what would the effect be on food prices? There are various predictions, but surely it would have some moderating effect on the rising cost of food.

What else do consumers want? A growing percentage of our customers are asking for information on specific special diets, sodium, cholesterol, fat, and calories. That is why in October of 1978, Giant began a pilot nutrition education program called Foods for Health, in cooperation with the National Heart, Lung and Blood Institute (NHLBI), a part of the National Institutes of Health. With coronary heart disease as our Nation's leading cause of death, NHLBI wanted to experiment with a program designed to give consumers information about what the experts know and don't know about diet and coronary heart disease. Giant agreed to work with the Institute on a year-long pilot program.

So far, we have distributed over 3 million copies of the consumer handout, called Eaters' Almanac, in 90 Giant stores. There are a total of 27 almanacs, a new one every 2 weeks, which cover topics such as heart disease, risk factors, food groups, fat, cholesterol, calories, sugar, salt, food labeling, seasonal themes, exercise, and diets. We've attempted to give consumers the most up-to-date information on diet and health, with a special emphasis on heart health.

But, many of the almanacs also give price information in the form of money stretching recipes, low cost substitutions for cooking, low cost protein combinations, ideas on how to save money in the supermarket, and meal planning ideas. The Eaters' Almanacs are displayed at the checkouts and in a special display holder in the dairy aisle. Large signs are located in the store and include shelf signs located beneath certain products.

NHLBI is now evaluating the program to see if there are differences in consumer knowledge and the sales of certain products, as a direct result of the information disseminated in the stores. The evaluation will compare Washington, D.C. stores to the control group of Baltimore stores. We don't expect a significant difference between these two groups, but we feel our efforts represent a beginning.

The program has been received so enthusiastically by consumers and professionals in our marketing area and across the country that we are now working on a continuation and expansion of the program. Foods for Health is to be disseminated nationally to other interested supermarkets, heart associations, and community groups and NHLBI is now working with the American Heart Association on these details.

I also want to mention a pilot program that Giant helped to develop at the request of the USDA Cooperative Extension Service. The program is aimed at giving consumers information on low cost, nutritious fruits and vegetables through a display in the supermarket's produce department which is staffed by USDA homemakers and volunteers. In January of last year, Giant tested the idea in three stores and received many positive comments from the homemakers and Giant customers who liked the idea of receiving low cost, nutritious suggestions at their local supermarket. This program is now being made available nationally through the USDA Extension Service. I hope it is only the beginning of more cooperative programs involving Government and business.

In conclusion, as you can see, there are many ways that retailers can help consumers cope with the rising cost of food. Many other ideas, besides the ones I've mentioned, are being developed and implemented by other supermarkets across the country. I hope we can all learn from each other. The Food Marketing Institute is also making available practical consumer information to their members. It is a beginning. Of course, these education and information programs will not directly reduce the cost of food, but they can assist consumers in getting more for their money.

FOOD AND AGRICULTURE: POLICY ISSUES FOR THE 1980'S

(By Howard W. Hjort, Director of Economics, Policy Analysis and Budget,
U.S. Department of Agriculture)

It is commonplace to proclaim at the end of each decade that the next decade will mark the beginning of a new era, that the problems will be more complex, more resistant to solutions, and fundamentally different from those of the decade left behind. Having said this, it is nonetheless the conclusion I reach after closely examining the fundamental conditions, both here and abroad, that will determine the economic health and future direction of our food and agriculture sector.

Agricultural and food policy has evolved over the years, changing more in response to shifting conditions and emerging problems than to political parties and elections. In this decade, important advances were made in the laws of 1970, 1973, and 1977. New legislation will again be required in 1981. Now we must face the challenge of anticipating future circumstances and problems confronting the food and agriculture system, and begin to devise policies that will be appropriate to the times.

In my remarks today, I want to examine the likely environment in the early 1980's, looking first at the world economy and the domestic economy, and then at the world and domestic food and agriculture outlook. From this, I will identify the important problem areas I foresee requiring policy prescriptions. Finally, I will present some views on the policies required to meet the challenges of the coming decade.

ECONOMIC CONDITIONS IN THE EARLY 1980'S

The agricultural production capabilities and the food consumption requirements across the regions of the world are importantly influenced by economic conditions. Therefore, policies needed in the coming decade must be developed with an understanding of the world and domestic economies. I begin with a summary of the conclusions that emerge from a review of these factors. One's crystal ball grows increasingly cloudy the further one looks into the future. Thus, I will focus primarily at the early 1980's, where present trends and known forces can reasonably be expected to prevail.

The world economy

Consumer prices increased rapidly throughout the world during the 1970's, three to four times faster than during the 1960's. The sharpest increases occurred in the middle 1970's.

Consumer prices on a world scale will likely rise at a rate above 1977-79 during the next few years, but they should not match the percentage

increases of 1974 and 1975. Sharp increases in the price of crude oil will be a key stimulant to general price inflation.

World economic growth in the 1970's—the change in gross domestic product after adjusting for inflation—has been well below the rate of the 1960's. During the mid-1970's, the world economy advanced at a snail's pace when most of the highly industrialized market economies actually regressed. The pace improved in the last half of the 1970's but a worldwide slowdown was evident, even before OPEC again boosted oil prices.

During the next 3 years, the world economic growth rate will be low by historic standards and below the rate observed during 1977–79. But growth should not slow to the rate of 1974–75. And like before, the highly industrialized market economies of North America, Oceania, Western Europe, and Japan will experience the slowest rates of real growth. The North Africa and Middle East, East Asia and Middle America regions will experience the most rapid rates of economic growth.

The world population growth rate will be slightly lower in the early 1980's than it was in the late 1970's. But, simply to maintain present per capita food consumption levels, food availability in Africa, the Middle East, and most of Middle and South America will have to increase at a rate three to four times that required in the highly industrialized market and centrally planned economies.

World financial reserves (SDR's) rose more rapidly in the 1970's than in the 1960's. But more important are a series of shifts that have occurred in the share of world financial reserves held by the major countries and regions of the world. The share held by North America and Oceania has declined sharply, remained stable for Western Europe, and risen for almost every other region of the world. The oil-exporting nations increased financial reserves at an extremely rapid rate from the early- to mid-1970's, but their share declined from the mid- to the late-1970's. The recent sharp boost in the oil price will again increase their reserves during 1980–82.

Most countries importing agricultural commodities on commercial terms have relatively high financial reserves. But most of the food aid recipient countries have low financial reserves, and those who must also import oil will be in an extremely difficult position in the early 1980's unless the richer nations provide more food, financial and technical assistance.

The U.S. economy

In the United States, inflation during the 1960's and even the 1970's was low by world standards. During the 1960's, the average annual increase in prices was lower in the United States than in any other major highly industrialized economy; in recent years, however, price increases in the United States have exceeded those in some other high-income market economies.

Presently, the U.S. inflation rate is near the record rate observed in the mid-1970's. While it can be expected to remain high during 1980–82, it also can be expected to decline from the 1979 pace. If the underlying rate is now 8 to 9 percent, as some believe, an average rate between 8 and 10 percent for the first 3 years of the 1980's may be optimistic

unless proper incentives to improve productivity, conserve energy, and stimulate savings are in place.

Real economic growth in the United States has been low over the past two decades by historic and world standards. It is expected to be very low in 1980 but should show a rising trend in 1981 and 1982.

Over the past 3 years, 7.9 million have entered the civilian labor force, and 9.4 million more have been employed. The unemployment rate declined and has remained below 6 percent for the first three quarters of 1979. However, the slide into a recession will lead to an increase in the unemployment rate for 1980, and, most likely, average in excess of 6 percent for 1980-82.

Relatively rapid inflation, higher unemployment, and slower economic growth will make it exceedingly difficult to close the gap between Federal receipts and expenditures, even though a record number will be employed during 1980-82.

The deficit on our trade account will remain large during 1980-82. The annualization of the June increase in crude oil prices, plus subsequent increases—even if they only approximate the rate of world price inflation—are likely to lead to continued increases in the crude oil import bill, even with a strong energy conservation program. Although the value of exports will increase, it will be difficult to overcome the rising value of imports. The dollar may have to decline further relative to other currencies during 1980-82 to bring about a positive balance on our goods and services account and to reduce the large deficit on our trade account.

The world agricultural economy

Worldwide conditions generally favored rapid growth in food consumption during the 1960's. Inflation was relatively low, real economic growth relatively high, and population growth relatively rapid. In addition, agriculture product supplies were large enough to keep commodity prices relatively low and stable. Food aid requirements were large, especially in South and East Asia.

This rapid growth in food consumption continued into the early 1970's. But growing demands collided with a significant decline in world production; accordingly, grain and oilseed prices escalated rapidly. Then came the first sharp increase in the price of crude oil. Poor crops in the United States followed in 1974, and the Soviets suffered a major crop disaster in 1975.

This combination of events triggered the most rapid escalation in agricultural and nonagricultural commodity prices to occur in modern history. The consequences were a sharp decline in the economic growth rate, sharp increases in the cost of food as well as in the inputs used to produce food, a sharp decrease in food available for aid, and a sharp decline in the rate of growth in world food consumption.

Since the mid-1970's, however, general demand factors as well as commodity supplies and prices have been favorable to growth in world food consumption. Crops—especially grain crops—were good from 1976 to 1978 and prices declined. Grain prices in 1977-1979 were not only well below the 1974-75 level but, in real terms, no higher than they were during the 1960's. Oilseed and cotton prices, higher during the last part of the decade, increased less than the rate of inflation in the world economy.

As reported in other sessions of this Conference, world grain production this year will be well below the 1978 level, while oilseed and cotton production will be higher. Crop production is at a record level in the United States, but down from last year's record for the rest of the world. There will be a reduction in world grain stocks from mid-1979 to mid-1980, but grain supplies are more than adequate to satisfy the world consumption requirement and oilseed stocks will be larger next fall than now.

Most of the world's beef and veal producers have been in a beef cattle inventory liquidation phase since the mid-1970's. That phase on a world scale will end in 1980, and the inventory buildup in the beef cattle population will continue into the mid-1980's unless there is an extreme shock to this subsector. Beef and veal production will rise at a relatively rapid rate.

World production and consumption of poultry meat in the early to mid-1980's will also increase. Gains in poultry and pork have been large enough to more than offset the decrease in beef and veal production in recent years. But the expansion in poultry and pork production has been more rapid in several major producing countries than can be sustained and there will be a slowdown in 1980.

Current indications suggest the slowest rate of growth in world meat consumption will be observed in 1980, followed by a recovery in subsequent years. Meat production prospects in the early to mid-1980's and the prospects for the world economy in the early 1980's both suggest that we are entering a period of moderately slower growth in world food consumption. The increase in the use of feedstuffs has been very rapid since 1975, but will be quite slow into 1981.

Even so, I do not believe that conditions early in the 1980's will be as adverse to gains in consumption as they were from the early to the mid-1970's. There are similarities: The increase in crude oil prices, the prospect of slow rates of real economic growth, especially in the highly developed market economies, and rapid price inflation. But agricultural commodity prices are not rising at the rates then observed, nor are they expected to unless the 1980 crops are poor.

These similarities do suggest a world commodity consumption pattern early in the 1980's similar to that observed from 1971-73 to 1974-75, but the rate of growth in consumption should remain well above the early to mid-1970's rate.

Further, the review of the world agricultural economy since 1960 leads me to conclude that in spite of the relatively pessimistic outlook for growth in world food consumption, the world agricultural sector will have to operate close to capacity through the early 1980's and at capacity for most of the decade.

Unfortunately, the prospect of relatively full production for the major crops does not necessarily imply that all will be well with respect to net returns to producers of agricultural products in the 1980's. Input costs have risen rapidly this year. Another sharp increase is in prospect for 1980. In the early 1980's, input costs will continue to increase. Farm product prices will have to rise to prevent an unbearable squeeze on net returns to producers.

In the 1980's the demand for feed for animals is expected to generate the greatest upward price pressure on agricultural product prices.

While growth in consumption of animal products will be slow in North America, Oceania, and Western Europe, it can be expected to be moderately high in the major centrally planned economies and very high in the high economic growth regions of North Africa and the Middle East, East Asia, and much of Latin America. In short, the growth pattern observed in the 1970's is expected to continue to be in evidence in the 1980's. Coarse grain and oilseed meal consumption will have to rise to satisfy the growing demand for livestock products.

Food price inflation after 1980 is likely to be slightly in excess of the rate of inflation in the general economy. Government costs for farm programs under near-full production will be relatively low. The value of our exports will continue to increase, especially for feed grain and oilseeds, but the rate of growth very early in the 1980's may not match the late 1970's record. We will likely face major problems in satisfying even the most pressing requests for food assistance in the early 1980's, especially if this Congress does not provide legislation for a food security reserve.

APPROPRIATE POLICIES FOR THE 1980'S

This review of the prospects for the 1980's suggests that our agricultural plant may be running close to capacity, with that capacity at times severely strained. This means most of the readily available cropland will be utilized: demand for production inputs—especially fertilizer, fuels and machinery—will continue strong. The handling system—storage, transportation, and port facilities—may be severely taxed at times. When this prospect is viewed in conjunction with aberrant weather patterns possibly disrupting production, the possibility of highly unstable prices is real.

It is essential, therefore, that our reserve policies be maintained and strengthened. The lack of interest in sharing reserve obligations by others in the world community places even greater importance upon our reserve policies. And with the virtual certainty that food assistance needs will rise in the early 1980's, this country's tradition of responding positively adds to the importance of our reserve policies and provides even deeper justification for a food security reserve. We must strengthen our reserve policy, making it even more explicit that this is a fundamental component of the Nation's food and agriculture policy.

Our policies have already been tested, and will continue to be tested in the early 1980's. So far, the test has been mainly of their ability to prevent economic disaster for our producers, but they were available this year when world production fell. There will be times when reserve programs will have to be managed to prevent prices from falling too low, but our reserve must also be managed to prevent economic disaster to our livestock producers and consumers, and to make sure we can be a reliable supplier in international markets.

At present it is our policy to permit grain producers to place eligible grain in reserve except when the reserve is in a "call" status. The market price to the producer, therefore, is a key consideration to the producer's decision to place grain in reserve. Our maximum stock and reserve quantity targets need to be reassessed periodically and made known to the public. When weather patterns are extremely favorable

and production is in excess of expectations, these "maximum" targets will be exceeded. When this happens, or when it becomes evident that the maximum stock and reserve levels are likely to be reached, the set-aside or diversion programs are available to bring stocks and reserves back into line.

We should be prepared to offer to producers of crops other than grain a reserve program when the supply-demand-price situation or outlook provides justification. We believe that farmers should continue to be the holders of all reserves, except a 4-million-metric-ton food security reserve. We continue to encourage the Congress to establish the policy that food aid commitments will be met from the food security reserve, even when prices are high and supplies short.

We will soon ask for comment on the rules governing our grain reserve programs. We need advice on questions such as:

Are the differentials between the call and release prices wide enough to prevent reserve commodities from flowing into the market in a disorderly manner?

Should the rules used to guide decisions concerning release, removal of release status, and calling loans be modified to make them more responsive to market price changes? Should these rules be modified to provide flexibility when market prices are affected by transportation developments and in moving reserves into the market when they have been called?

Should we continue having reserve release prices at 140 percent of the loan price for feed grains and 125 percent of the loan price for feed grains?

Except for milk, the authorities with respect to commodity loan prices appear to be sufficiently flexible to accommodate the changes likely to be experienced in the 1980's. Under current policies loan prices for the feed grains and wheat reflect normal market price relationships. So do those for corn and soybeans. Loan prices, therefore, are neutral with respect to acreage shifts, so that market prices encourage the appropriate shifts in production.

Target prices are based upon cost of production and the same components of cost are to be covered for each target price commodity. I believe there is general agreement that the purpose of target prices is to prevent economic disaster, and that they should be set at a level that at least covers the nonpostponable production and family living expenses.

There is growing concern over the relationship between target prices and production costs, since the formula governing changes in target prices is based upon the past instead of the present.

Our programs to protect producers from natural disaster are inadequate, but we are hopeful that the Congress will authorize a new crop insurance program.

Concern over the use of our land is deepening, which leads to questions about how best to encourage farmers to use their best land for crop production, how landowners can best be encouraged to manage their land so that it will be more productive when they transfer it to a new owner, and the need for Congress to pass legislation that provides authority to withhold Federal program benefits to farmers that fail to follow sound land use and farming practices?

Structural considerations

The situation that I have outlined for the decade ahead—especially the rising cost of farm inputs—will affect the structure of our farm sector.

Already, the high price of fossil fuel has caused adjustments in U.S. agriculture, and it could lead to even more significant changes during the 1980's. Farm organization may undergo modifications as producers seek alternative energy sources or explore new production techniques. Farming's capital requirements will undoubtedly be affected.

In addition, rising energy prices could alter national production patterns. Regions that previously produced specific commodities at low cost may find their advantage whittled away by higher production and transportation expenses.

This situation needs to be watched closely. We need to consider carefully the ability of our current farm structure to deal with the changing energy picture and how to improve the sector's capacity to cope.

Similarly, the continued rise in land values will be a source of mounting concern during the 1980's. Escalating land values have given an advantage to operators who already own acreage. With their equity growing, these producers have the means to secure loans, buy out their neighbors and expand their operations. But rapid escalation in land prices makes it extremely difficult for the beginning farmer to purchase land or even pay the cost of operating someone else's land.

There is evidence today that the wrenching technological revolution that has transformed our farm structure since World War II may be ending:

Farm numbers continue to decline, but at a slower rate.

Farm size continues to increase, but also at a slower rate.

Productivity continues to rise—but, again, at a slower rate than before.

Perhaps most important of all, there seems to be no technological breakthroughs on the immediate horizon that will have an impact on farming comparable to that we have experienced in the last 40 years.

Yet, to my mind, this makes the need for careful consideration of our farm structure more important than ever. Rapid technological advances in the past have helped to offset the pressure of inflation and rising costs on farmers. Those advances kept our food prices low, freed people for nonfarm jobs, and all but guaranteed ample quantities of food for foreign trade.

As the buffer of new technologies erodes, however, greater attention must be paid to organizational changes taking place in the farm sector, their effects on the sector's performance and the sector's ability to meet the challenges confronting it. Among these are:

Rising production costs—including rapidly increasing land prices.

Changing market structures and increased dependence on foreign markets.

Barriers to entry for beginning farmers and growing problems of intergenerational transfer for farm families.

Increasing pressure on nonrenewable resources such as land, water and fossil fuel sources and competition for nonagricultural uses for resources.

Continued pressure on farmers to expand operations to meet costs without serious environmental side effects.

The need to develop technology which can increase production without serious environmental side effects.

Meeting each of these challenges will present the public with important choices and tradeoffs. There will be additional pressure for government policies which treat the problems of one sector or group of people without either damaging the interests of another group or asking the individual citizen to pay too great a price. Today, at the time when the demands on government policy are the greatest, the public's tolerance for misdirected or unnecessarily burdensome programs and regulation is at an all-time low.

The problems that we will face in the 1980's will differ substantially from those that have concerned us during the past several decades. Rather than excess capacity, excess land and labor resources and low prices, the problems will lie in bringing additional land into production, ensuring good conservation practices on acres already in use, overcoming rapidly rising input costs, and seeking more efficient ways to use our land, water and energy resources.

These issues and many of the others that I have discussed are affected by the organization and control of farming's productive resources, by the structure of the farm sector. The development of appropriate policies for the 1980's will demand that this aspect be considered with increasing care.

POLICY ISSUES FOR THE 1980'S—DISCUSSION []

(By Alex F. McCalla, professor of agricultural economics, University of California-Davis, Davis, Calif.)

I. INTRODUCTION

It is an honor and a pleasure to be asked to participate in this conference and to comment on Howard Hjort's paper. I have resisted the temptation to write my own paper and then argue to you that it is relevant. Rather, I shall attempt to focus on Mr. Hjort's issues as outlined in a draft of this paper that I received yesterday morning. I want to focus principally on the international dimension of the policy setting for the 1980's. However, I will also comment on some domestic implications, particularly regarding structure, regional differences, and, in keeping with my California base, if there is time I will comment on the total absence of any mention of fruits, vegetables, nuts and other specialty crops which are regionally important at least. Mainly I want to draw out some policy implications of the trends Mr. Hjort discussed. Most of them he has mentioned so I'll simply highlight them.

II. INTERNATIONAL DIMENSIONS

It is gratifying to find that the international dimensions of domestic agriculture policy are the theme of this conference and that they play such a prominent role in Mr. Hjort's comments. It is also correct and crucial that they are highlighted. All too recently, discussions of domestic policy treated the international market as an afterthought or as a sink down which to dump excesses from domestic policy decisions.

I have no quarrels with Howard's global aggregates such as inflation, population, financial reserves and consumption projections. He and his staff know better than I. But I think sometimes we tend to look at aggregates in the short run without recognizing regional and commodity differences in a longer term context. Thus let me try to augment Howard's comments by looking in a little more depth at the changes in international markets over the last 10 years and asking what these trends portend for the future.

Let's refresh our memories a bit:

U.S. agricultural exports totaled \$32 billion in 1978-79—nearly more than four times the value in 1970;

\$22.5 billion of that or more than two-thirds was in three commodities—wheat, coarse grains (principally corn) and soybeans;

World trade in wheat increased in the 1970's from 50 to 55 million metric tons in 1970 to approaching 80 million metric tons in 1979-80;

U.S. exports of wheat increased from 19 to 38 million metric tons with the U.S. accounting last year for 48 percent of world exports;

In the last decade between 50 percent and 70 percent of U.S. wheat production entered international markets;

Even more growth occurred in coarse grains (feed);

World trade increased from around 45 million metric tons to nearly 90 million metric tons—or it doubled;

U.S. exports increased from 18 million metric tons in 1970 to over a projected 70 million metric tons (350 percent increase) in 1979–80 with the U.S. accounting for around 60 percent of world exports;

In the last decade, coarse grains exports, as a percent of domestic production, have risen from 12 percent to 25 percent; and

Even more phenomenal growth has occurred in oilseed (principally soybean) exports. But I won't detail that—I think I have made my point. U.S. agriculture is increasingly dependent on international markets for its well-being. Even if Howard is right that the growth rates in the 1980's will slow, the international market will remain an increasingly significant variable.

But the growth in international markets has not occurred uniformly across world regions nor is it likely to do so in the 1980's. If one divides the world into 3 regions—Developed (Western Europe and Japan), Centrally Planned (U.S.S.R., China, Eastern Europe) and Developing (LDC's)—one finds the following significant structural changes in international markets:

Wheat—most of the growth in wheat exports was to LDC's (now 60 percent of market), net exports to DC's declined so that traditional developed country markets make up less than 20 percent world trade and exports to Centrally Planned economies increased somewhat but their most significant descriptor is variability.

Coarse Grains—on the other hand growth in coarse grains imports was in DC's, CP (again variable) and higher income LDC's—low income LDC's are not important.

Oilseeds—principally in DC's and some Centrally Planned and a few high growth was LDC's.

Are these trends in regionality and commodity differentials going to continue? My guess is that they will. If that is true the implication for U.S. prospects are clear. For example, foreign exchange earning of LDC's will be crucial to the wheat market whereas economic growth and inflation in DC's will be crucial to feed grains and oilseeds markets. I'm not suggesting Howard didn't allude to this but rather emphasizing that global aggregates sometimes obscure critical regional and commodity trends.

III. DOMESTIC IMPLICATION OF GROWING INVOLVEMENT IN INTERNATIONAL MARKETS

Here I want to make quickly several points:

1. Because the growth in U.S. exports has greatly exceeded that of our export competitors, our dominance in international markets has increased. Given that we remain the only major participant in international commodity markets for grains that lets domestic and international prices interact, it means that domestic policy actions influence

world prices which in turn influence farm incomes. For example, the price we set for the loan rate clearly is a floor price in international markets. How we disperse from reserves or stocks clearly influences world prices on the high side. In some senses this is a chicken and egg or circular problem but we must be cognizant of it in our domestic policy discussions. In this area the interface between public and private sectors are crucial.

2. Increased agricultural exports and the resultant increase in the net agricultural trade balance has coincided with rising trade deficits as a result of oil price increases. Agricultural trade has become an element (means) of national economic and trade policy. With this comes continual pressure to increase exports. But is this necessarily good? Professor Jimmie Hillman, among others, has frequently raised the question recently about whether or not there is some optimum level of exports beyond which we as a nation may lose from further expansion. Here I mean that constant pressure to increase output may have impacts on our long run land quality, on environmental quality, may strain our transportation system and in particular may have implications for the structure of agriculture. Let me expand that a bit. If, as appears to be the case, the largest farmers are the most efficient and the most responsive to shifting market signals then a focus on increasing traditional exports may require policies which implicitly if not explicitly favor large scale commercial agriculture at the expense of some modest structure. Also are we following our natural comparative advantage by exporting land extensive crops?

3. Increased dependence on international markets increases our vulnerability to global uncertainty either arising from weather or the whims of national government. In particular if most other countries are pursuing protectionist agricultural policies which export instability, the United States as a large residual supplier will have transmitted to it significant price instability.

IV. SOME DOMESTIC COMMENTS

Here in the sense that global aggregates may obscure interesting regional or commodity differences, the same is true of national aggregates. Again just a few brief comments:

1. *Resource Impacts*.—Prof. Don Paarlberg has argued, I think correctly, that agriculture in the 1980's will no longer have exclusive first priority claim to natural resources. If we want to continue to increase output to satisfy world demand we may run up against competing nonagricultural uses for land (this related to my earlier point on mining our land resource). Similarly a U.S. population continues to grow and water sources don't, both because of environmental and fiscal constraints, competition for water for irrigated agriculture will increase. In California, for example, the question is already being asked as to whether high water using low value crops (e.g., alfalfa, irrigated pasture, rice) should be given lower priorities than urban and industrial use.

2. *Regional Impacts*.—National farm policy and trade policy operates in part through commodities and commodities are not produced evenly spread over the entire country. Thus national policies will have different regional impacts. We need to be aware of this.

V. CONCLUDING COMMENTS

In case my prior comments have suggested the contrary, I must state that I agree with most of what Howard had to say. I think his prognosis is correct at least if I interpret it correctly. Domestic and global variables will continue to increase the demand for agricultural output, though with differing rates of growth among products. This growth, though slower than the 1960's and early 1970's will in general press against supply raising capacity and stability questions. Given that the characteristics of the agricultural industry described by Professors Schultz and Cochrane three decades ago still seem to prevail—namely that agriculture is prone to instability in the short run—then the pressure of demand against supply portends instable times ahead. Thus, Howard's concerns on stocks reserves and food security are well taken. Given that we seem to be the only country seriously willing to hold stocks, our future policy must take these issues into account. In general the immediate challenge ahead is to manage instability.

My comments go beyond 1980 however I think it is important that we keep shorter term discussions in a longer term context. Clearly what we do next year, how we respond to short term situations constrains future options. Thus, I guess my most significant point is that we must constantly ask ourselves whether continuation of short term trends for example, expanding exports, are in our longer term interest.

214 AGRICULTURAL POLICY ISSUES FOR THE 1980'S: DISCUSSION

(By Luther Tweeten, Oklahoma State University)

A decade ago this session might have focused on the problems of redundant labor in farming, surplus production capacity, and the great farm-urban exodus. The issues have changed, as apparent from Howard Hjort's paper. I will devote my discussion largely to three interrelated issues for the 1980's: Farm output supply-demand balance, inflation, and farm structure.

SUPPLY-DEMAND BALANCE

The Nation is poised on the threshold of a new decade without excess production capacity and with long-term prospects for demand to increase faster than supply of farm output. To be sure, periods of excess supply will emerge intermittently—one could occur with back-to-back abundant Soviet grain harvests. I do not call for dismantling machinery either for set-aside of cropland or for farm price supports, but the 1980's are likely to be dominated by greater concern with excess demand than with excess supply.

I review the outlook for the 1980's by elaborating on a study published earlier this year.¹ Focus is on aggregate supply and demand because shortages or surpluses in one commodity or region spill over into other commodities and regions until the farming sector as a whole shares in economic dearth or surfeit. Expected shifts in supply and demand are discussed before examining projections of prices and incomes.

Supply.—The supply of farm output fluctuates widely from year to year due to weather, but the secular trend in supply is determined by productivity as measured by output per unit of conventional farm inputs. Productivity increased by 1.7 percent per year from 1967 to 1977. Productivity grew a total of only 2 percent in the last half of the 1960's but grew on the average by that much each year from 1970 to 1977. That rate of gain is unlikely to be sustained because a major source of increased productivity, publicly supported agricultural research and extension, has received little real increase in funding in recent years. Productivity gains have been fueled in part by substitution of petroleum products such as fertilizers, pesticides, and diesel oil for less productive conventional farming inputs. Higher oil prices restrain such substitution and dampen productivity gains. Oil prices

¹ See Luther Tweeten, "Economic Outlook for Great Plains Agriculture," pp. 1-26 in Proceedings of Great Plains Agricultural Council (Meeting in Amarillo, Tex., July 1979), Lincoln: Great Plains Agricultural Council, University of Nebraska. Farm price and income outcomes for a wide range of demand-supply growth rates are projected in that paper.

will continue to rise although not as sharply as in recent months. Most of the members of the National Association of Business Economists, polled recently, predicted oil prices would rise 4 percent per year or less in real terms during the first half of the 1980's. In short, American farmers are unlikely to sustain the 2 percent annual productivity growth rate of the 1970's because technology development, energy prices and perhaps weather will be less favorable. Lu, Cline, and Quance report expected rates of productivity growth ranging from 1.02 to 1.32 percent annually for the 1980's.² These estimates appear to be conservative and I project a baseline or most likely productivity advance of 1.5 percent per year in the 1980's.

Demand.—Rates of growth in demand for farm output depend on growth in exports, domestic population, and income.

Domestic population grew 0.89 percent per year from 1967 to 1977 but by only 0.78 percent per year from 1976 to 1977. Clearly the rate is slowing and domestic population is projected to grow by 0.70 to 0.75 percent annually in the 1980's. Real disposable personal income per capita grew on the average by 2.44 percent per year from 1967 to 1977. Problems with energy prices, savings, investment, and labor productivity likely will reduce the annual rate of growth in consumers real income per capita to the 1 to 2 percent range in the 1980's. This combination of population and income growth implies domestic demand for food and fiber will expand by approximately 0.9 percent annually in the 1980's.

The total demand for farm output will expand more from foreign than from domestic sources in the 1980's. Foreign demand is volatile and hard to predict. Sharp increases such as occurred in 1972-73 and 1979 cannot be sustained. Energy plays a key role in future demand. Substantial increases in foreign oil price will depress ability of oil importing countries to buy American grain. Non-oil-exporting developing countries will be especially restrained in meeting their massive import needs by lack of foreign exchange; and our balance-of-payments difficulties preclude our providing large amounts of food aid. But higher oil prices encourage U.S. farm exports by (1) increasing the food buying power of oil exporters, and (2) creating larger U.S. trade deficits which cheapen the dollar and make U.S. agricultural products a bargain on world markets.

Demand for our farm products by centrally planned countries will not continue to grow at rates experienced in 1979. Demand for our products will be dampened in these countries by lack of foreign exchange and desire to avoid high dependence on the United States for something so strategically important as food. The quantity of U.S. farm exports grew 5.3 percent per year from 1967 to 1977. I project that farm product exports in real (quantity) terms will increase 5 percent per year in the 1980's. This is a somewhat higher rate than those of 3.5 to 4.4 percent projected for 1975-85 by the Foreign Demand and Competition Division of the Economic Research Service of the U.S. Department of Agriculture in 1975.³

² Yao-chi Lu, Philip Cline, and Leroy Quance. "Prospects for Productivity Growth in U.S. Agriculture." Agricultural Economic Report No. 435. Washington, D.C.: Economics, Statistics and Cooperative Services, U.S. Department of Agriculture, 1979.

³ Chung Yeh, Luther Tweeten and Leroy Quance. "U.S. Agricultural Production Capacity." American Journal of Agricultural Economics 59 (1977): 37-48.

The total rate of increase in demand for farm output is the sum of rates of growth in domestic demand and foreign demand weighted by the proportions of output going to the respective markets. Based on past trends, the Nation will export 27 percent of farm output in the early 1980's. Hence, total demand is expected to increase annually by $0.27(5.0) = 1.35$ percentage points from foreign sources and $(1 - 0.27)(0.9) = 0.66$ percentage points from domestic sources for a total of 2 percent per year. These figures suggest that exports will account for two-thirds of the growth in farm product demand.

Inflation.—Economic outcomes for the farming sector depend also on the national inflation rate. Measured by the implicit deflator of the gross national product, the inflation rate averaged 6 percent annually from 1967 to 1977, 5.4 percent from 1975 to 1977, but has averaged 12 percent in recent months. With such disparity in estimates, it is useful to consider two annual rates, 6 and 12 percent, for the 1980's.

Income and price projections.—With demand increasing 2 percent per year and supply by 1.5 percent, net farm income increases from \$28.3 billion in 1978 to a projected 35.1 billion 1978 dollars in 1985 and 41.4 billion 1978 dollars in 1990. The ratio of prices received to prices paid by farmers increases from 72.5 percent of the 1910–14 average in 1978 to 74.1 percent in 1985 and to 75.6 percent in 1990.

If inflation passthrough is complete so that increases in the general price level are fully reflected in prices received as well as in prices paid by farmers, these real income and price projections are invariant to the rate of inflation. The \$161.3 billion of net farm income in current dollars projected for 1990 with 12 percent inflation are only 41.4 billion 1978 dollars, the same value as with no inflation to 1990.

If inflation passthrough is incomplete, real economic outcomes for farmers are influenced by inflation. Recent research at Oklahoma State University indicates that each 1-percent increase in the general price level reduces the ratio of prices received to prices paid by farmers by about 0.75 percent, other things equal. Under this condition, with 6 percent national inflation, and with demand and supply increasing respectively by 2 and 1.5 percent per year real net farm income (1978 dollars) drops slightly from \$28.3 billion in 1978 to \$26.4 billion in 1985 and \$27.1 billion in 1990. The conclusion is that the economic outlook for the 1980's, though bright, is clouded by inflation—and energy prices are an important component of that inflation.

STRUCTURE AND CASH FLOW

The current low profile of commodity programs and absence of set-aside provide an interlude to reflect on the kind of farming structure (size and number of farms, tenure, etc.) that markets, technology and public policy have brought about or could bring about. We observe a highly productive farming industry that is the envy of the world. It is also a farming industry well on the road toward extinction of its basic unit—the full-time family farm. By the end of the century, about 50,000 farms of a larger-than-family type will provide the majority of farm output if past trends continue.

While numerous forces speed demise of the family farm, I focus here mainly on the role of cash-flow problems brought about by general

inflation and real growth in land earnings. Inflation raises mortgage interest rates but does not raise the current rate of land earnings to land prices. In time, land earnings and provide capital gains which compensate for high mortgage interest costs and provide favorable long-term returns of land investment.

But a family farm limited in off-farm income and equity financing is disadvantaged in competition with a diversified, publicly held corporation with access to large numbers of investors pleased to receive capital gains for tax savings. The family farm needs current income to meet cash costs of production and family living. Thus inflation makes entry or expansion difficult for family farmers and encourages land ownership to shift to the nonfarmer.

If growth in demand exceeds that in supply in the 1980's the family farm would appear to be headed for robust financial health if inflation is checked. It is disturbing to note that a favorable demand-supply balance intensifies the cash-flow problem for the family entering farming. Each percentage point by which growth in land earnings exceeds the inflation rate tends to reduce the current return on land by 1 percentage point and to increase the real capital gain by 1 percentage point.

TABLE 1.—ILLUSTRATION OF CASH FLOW IN THE INITIAL YEAR WITH FULL DEBT FINANCING OF FARMLAND
(Percent of land value)

Item	Inflation and real land earnings growth rate			
	No national inflation and annual real growth in land earnings of—		6 percent national inflation and annual real growth in land earnings of—	
	0 percent	2 percent	0 percent	2 percent
Cost: Mortgage interest rate.....	3	3	9	9
Returns:				
Current earnings.....	4	2	4	2
Deferred earnings.....	0	2	6	8
Real capital gains.....	(0)	(2)	(0)	(2)
Nominal capital gains.....	(0)	(0)	(6)	(6)
Total returns.....	4	4	10	10
Cash flow surplus (deficit) ¹	1	(1)	(5)	(7)

¹ Current earnings rate less mortgage interest rate.

Table 1 illustrates with as realistic data as possible the two cash flow impacts described above. Without inflation, mortgage interest rates would be about 3 percent. With general inflation at 6 percent, mortgage interest rates are the real rate of interest, 3 percent, plus the inflation premium, 6 percent, for a total of 9 percent. With or without inflation the current return to land (ratio of land rent or earnings to current land price) averages about 4 percent if farm output demand and supply increase at similar rates and land earnings keep pace with inflation. Six percent inflation adds capital gains of 6 percent for a total return of 10 percent to farmland. Thus total returns of 10 percent on farmland exceed the 9 percent interest on mortgages by 1 percentage point as compensation for risk in farming. But whereas without inflation the current cash flow surplus is 1 percent of land value (column 1, table 1), with inflation the cash-flow deficit is 1 percentage

point less than the inflation rate—5 percent in this example (column 3, table 1). If inflation is 10 percent the cash-flow deficit is 9 percent of land value.

Based on supply increasing .5 percentage points greater than demand as projected earlier for the 1980's, with full passthrough of inflation to farm prices paid and received farm receipts are estimated to increase 2 percent per year in excess of general inflation. To estimate return to land, receipts are adjusted for two effects—(a) the dampening impact of less than full passthrough of inflation on the ratio of prices received to prices paid by farmers, and (b) the pattern of land earnings increasing more than proportional to receipts. The effects largely offset each other so that real land earnings and real capital gains can be expected to increase about 2 percent annually. Without any national inflation but with real growth of 2 percent annually in land earnings, the cash flow deficit is 1 percent (column 2, table 1). With 6 percent national inflation and real gains in land earnings of 2 percent annually, the cash-flow deficit is 7 percent (column 4, table 1). Farm family labor-management earnings, which potentially could be used to finance the cash-flow deficit, averaging less than 2 percent of real estate assets on a typical farm, even if fully applied to service debt cannot cope with a cash deficit several times as large as the total labor-management income. The alternative to ownership because tenancy, off-farm employment and financial assistance from concessionary sources such as parents or Government credit agencies.

The example illustrates forcefully that despite the favorable farmland investment return averaging 10 percent over the life of the investment with 6 percent inflation, the family farmer at best experiences years of austerity and sacrifice until liquidity problems are under control. With 6 percent inflation, about 15 years are required before annual land earnings equal mortgage interest outlays on land. The cash flow deficit arises because capital gains are deferred earnings—once the cash deficit years are behind and capital gains accumulate, the established family farm is in a commanding financial position to outbid others for land.

CONCLUDING COMMENTS

Although it is well to recognize that public policy for agriculture will be dictated in the 1980's more by emerging circumstances than by the scenarios laid out today, still it is well to recognize that contemporary public policy decisions will make a difference.

Examples of critical policy decisions are numerous:

(1) Will farm commodity price and income supports and set-aside programs be abandoned in the 1980's because of excess demand for farm products and inability of farmers as a minority to generate sufficient political support for such programs? My guess is the answer is "no." In world perspective, nations with small proportions of their people in farming provide generous farm price and income supports, while nations with high proportions of their people in farming tax farmers and farm products or set ceilings on food prices. In addition to pending commodity program issues, new issues could include devising a program to dampen livestock cycles with measures acceptable to producers, consumers, and taxpayers.

(2) Will legislators take decisive action to establish a "structure policy" to preserve the family farm and avert an agriculture comprised of two major types of farms: a few very large, corporate, industrial farms and many small, part-time farms? Limitations on commodity program payments and Federal tax provisions (investment credits, accelerated depreciation, and interest payment writeoffs) are likely to be mild and not very effective because farm organizations are ambivalent in their attitudes toward restraining growth of large farms.

(3) A major deterrent to continuation of a family farm structure is cash flow problems associated with inflation. Will the Nation elect to bear the consequences of extended recession to break the deeply ingrained inflationary psychology of today? I think the answer is "no" and inflation will continue at a rate of at least 6 percent in the 1980's.

(4) A second source of cash flow problems that threatens family farm entry is rational expectations that land earnings will increase faster than the general price level. Will public policy move to reduce this source of the cash flow squeeze by increasing productivity of the farming sector through investment in agricultural extension and research? Failure to invest adequately in low-cost sources of future output is a nationwide problem contributing to inflation as well as increasing real returns to farmland. Underinvestment is the product of competing claims for tax dollars, desire to cut taxes, and lack of public understanding of the importance of such investment to holding down the cost of food, to balance of payments, and to environmental protection.

(5) Rising energy costs are a serious problem for many farmers, particularly irrigators. Farmers may learn to live with high energy prices but, because of the importance of timeliness in biological processes, farmers find it difficult to live with uncertainty of energy supplies. Will public policy allocate (a) energy supplies so as to eliminate shortages, and (b) investments to bring into production the most efficient energy sources? My guess is "no"; but even if the answer were "yes," the unstable policies of OPEC probably destine the Nation to a decade of periodic energy crises.

(6) Will the real cost of farm food ingredients increase in the 1980's? Defining the real cost of farm food ingredients as the real value of farm supplied ingredients in food divided by consumer real income, I project no significant rise in the ratio—the numerator and denominator probably will rise less than 2 percent per year. However, food prices may rise faster than other prices because the farmer will be called upon to play a major role in paying our oil import bill or in supplying energy directly in the form of alcohol or gasohol. Barring major political upheaval in OPEC, it will probably be cheaper to supply our energy needs by importing oil paid for by exported grains and soybeans than to produce gasohol. Despite slow growth in funding of agricultural research and extension, the impressive productivity of the American farmer will continue to be a force in restraining general inflation. The reason is that in the absence of large food exports, the value of the dollar would drop and American consumers would pay higher real prices for imports across the board—for oil and other items.

(7) Have farmers paid too much for farmland and will the speculative bubble burst in the 1980's? The answer seems to be "no" on both accounts. The long-term rate of return on farmland appears to be very favorable. Land is clearly overpriced for the entry level family farm owner-operator faced with cash-flow problems. The part-time farmer with access to substantial off-farm earnings or the corporate conglomerate with diversified sources of income and equity capital is not necessarily restrained by cash-flow problems, however, and finds farmland an attractive investment.

245 OUTLOOK: U.S. AGRICULTURAL EXPORTS IN THE 1980'S

(By Turner L. Oyløe, Assistant Administrator, Commodity Programs, Foreign Agricultural Service, U.S. Department of Agriculture)

There have been fundamental changes in the world economic situation in the past 10 years, which have impacted on U.S. agricultural exports. In all probability, those fundamental changes which occurred in the 1970's will continue to play a major role in directing our agricultural trade in the decade of the 1980's.

Therefore, in order to attempt an evaluation of the future, it may be helpful to understand what happened in the last decade. What has indeed happened in the past 10 years to U.S. agricultural exports? Well, first of all, U.S. agricultural exports increased from \$8 billion in 1971 to an estimated \$38 billion in 1980, or over a fourfold increase. The volume of agricultural exports increased from 70 million metric tons in 1971 to an estimated 160 million tons in 1980, or more than doubled.

The major factor stimulating U.S. agricultural export demand in the 1970's was the desire in foreign countries to upgrade diets and the ability of these countries to pay for the imported food and feed-stuffs. Estimated increases in world consumption tend to support the importance of the demand among consumers for better diets. During the period 1972-78, world utilization of oilseeds increased from about 46 million metric tons to 81 million metric tons. Soybean meal accounted for about 72 percent of the increase in total utilization during this period. During this same period, use of feed grains increased from about 635 million metric tons to 738 million metric tons or by 103 million metric tons. Contrast these increases for feed inputs with the consumption of wheat, basically a food grain, where world consumption increased by 57 million metric tons during the 1972-78 period.

Export demand increased in part due to the modest rate of economic expansion in most Western European countries, somewhat higher rates in Eastern Europe and the Soviet Union, and high levels of economic expansion in Japan and some developing countries including Korea, Taiwan, Mexico, and others. Then there was the extraordinary income increases in the OPEC countries. More income has led to greater purchasing power, part of which has been spent on upgrading diets. As an example, the rate of expansion in meat consumption in the mid-1970's was considerably higher in Europe, the Soviet Union, and Japan than in the United States. Further, in some countries, increasing costs and limited capabilities to expand commercial fish production has restricted the growth in the availability of this high-quality consumer protein.

We can expect that the world pattern of income expansion which we witnessed in the 1970's will probably continue in the decade of the 1980's. It is also probable that relatively high rates of population growth will continue in the OPEC countries, and in the advanced developing countries including Brazil, Mexico, South Korea, Taiwan, and others.

According to most economists, a depreciated currency acts as an export subsidy and an appreciated currency an export tax. The depreciated U.S. dollar has certainly played a major role in recent years in assisting U.S. agricultural exports in remaining competitive in the international market. As an example, our two major soybean export markets are Japan and Germany. During the period 1970 to 1978, the price of soybeans in dollars increased by 142 percent, while in Japanese yen and German marks the price increased by about 38 percent and 22 percent, respectively.

What happened in soybean prices was also reflected in the prices of other major agricultural commodities. While the currency situation remains fluid, we do not expect to see the dollar value continue to decline in the next decade as it has in the past few years. However, it would appear that the dollar will continue to assist the United States in remaining competitive in world markets.

We can expect that a continuation of past economic trends will require increasing levels of exports from the United States. As indicated earlier, total world feed grain use increased by about 103 million metric tons from the early 1970's to 1978. This increase occurred at a time when there was no increase in U.S. disappearance. It also was a time in which U.S. feed grain exports increased from an average of 21 million metric tons in 1971-73 to 55 million metric tons in 1978. To a lesser extent, the same situation took place in soybeans. U.S. domestic soybean consumption averaged 11.8 million metric tons during the 1971-73 period and 16 million metric tons in 1978. This increase in U.S. domestic consumption of over 4 million metric tons compares with increased U.S. soybean exports of 8 million metric tons during the same comparative period.

Based on the past decade, we could be looking forward to increased exports of 85 million metric tons of wheat, feed grains, and soybeans by 1990. If the export mix remained about the same in 1990 as we estimate for 1980, our projected increase in exports would be about 43 million metric tons of feed grains, 24 million metric tons of wheat, and 18 million metric tons of soybeans.

Where would these additional quantities come from? Projecting yield trends, we could expect to pick up an additional 19 million metric tons of feed grains, 4 million metric tons of soybeans, and perhaps 4 million metric tons of wheat. Consequently, our 1980 base acreage could be expected to provide an additional 27 million metric tons of grains and soybeans by 1990. Utilizing the projected 1990 yields, we would then require an additional 10 million acres of feed grains, 20 million acres of wheat, and 16 million acres of soybeans for a total increased acreage of 46 million by 1990. This increase would be about equal to the expansion in harvested acreage which took place from 1971 to 1980. It should be noted that the set-aside acreage for wheat and feed grains was about 32 million acres in 1971. While there cer-

tainly is substantial acreage available in the United States for this type of expansion, there could be some concern regarding the cost of bringing further acreage into production. Undoubtedly, expansion in our production capability would require significant expenditures of investment capital at the farm level.

Internal domestic transportation of bulk agricultural commodities could also be a rather critical problem in the years ahead. This problem could be further compounded by the limited availability and increasing fuel prices. The obvious answer to this question is to utilize those modes of transportation which are the most fuel efficient. We estimate that a typical river barge can carry about 409 tons 1 mile by using 1 gallon of fuel. Rail movement requires an estimated 1 gallon of fuel to move 208 tons 1 mile. Trucks on the other hand utilize 1 gallon of fuel to move 70 tons of cargo 1 mile. Therefore, on a fuel-efficient basis, rail transport is about half as efficient as barges, and trucks are about one-third as efficient as rail.

This evaluation is based only on fuel efficiency. Unfortunately, barges and railcars are often not available to meet seasonal agricultural commodity transportation requirements or in some instances just not available.

The state of our railroads especially in the Midwest appears to be less than desired. A number of branch lines serving rural areas have been closed and others have reduced traffic. The number of small 40-foot railcars serving rural areas is declining at a rate of 500 per month, down from 77,000 cars in June 1978 to 63,000 cars 1 year later. Statistically this reduction has been more than offset by a program of increased production of jumbo hopper cars where numbers are increasing at the rate of 1,800 per month. However, these jumbo railcars are more efficiently used in unit trains. Rural service to the major terminals remains a major problem. There is also a question regarding how many more trains can be placed on the existing railbed network before serious breakdowns become the rule instead of the exception. In some areas, poor railbeds have reduced the safe speed for trains to 7 miles per hour.

Approximately 63 percent of our total exports of soybeans, meal, wheat, and feed grains move from gulf ports. Barge and rail account for most of the movement to gulf ports in about equal proportions. The crucial problem in expanding barge transportation is lock and dam 26 which is located at Alton, Ill., on the Mississippi River, just south of the junction of the Mississippi with the Illinois River. In 1978 about 30 million metric tons of wheat, feed grains, and soybean meal passed through lock and dam 26. While there are a number of arguments regarding the true capacity of this particular lock, the fact remains that the backup at the lock can be 4 days in good weather and up to 20 days in bad weather. Improvement of this important navigational bottleneck is required if we are to be assured that this mode of transportation will continue to carry the increasing levels of agricultural exports projected for the 1980's.

There remain a number of important issues which have not been discussed and which could significantly impact on U.S. agricultural exports. These issues include the possible impact of the energy crisis on international economic development; world recession and the negative impact on the international trading climate; and the possibility

of a major technological breakthrough in grain and oilseed yields. There are also a host of other factors which could significantly change the U.S. agricultural export situation. However, these are factors which cannot be clearly evaluated in this temporal setting.

There is, however, one factor which will continue to impact on U.S. agricultural exports from year to year and that is the weather. Usually there are offsetting weather patterns in the world such as this year which resulted in a decline in the anticipated Soviet grain crop and excellent crop conditions in the United States. We can also anticipate that commodity price movements will continue to play the traditional role of rationing supplies during periods of shortages. These factors along with the present program of farmer-held reserves can be expected to cushion the situation in times of weather-induced short supplies and build stocks during years of surplus production.

In conclusion it appears that the demand for U.S. agricultural exports will continue to expand based on a reasonably healthy world economy, growing population, and competitive U.S. export prices. The U.S. crop production base given the proper incentives should be able to meet the anticipated increase in the export demand. Major problems could arise in the internal domestic transportation system which is presently functioning at what appears to be close to maximum working capacity. Major capital improvements in the transportation system are required to increase the efficient use of scarce energy resources. The year-to-year fluctuations in U.S. and world production of major agricultural commodities will in part be cushioned by the U.S. farmer-held reserve program and by market prices.

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TRANSPORTATION—1980 [7]

(By John O. Gerald and Robert J. Tosterud, agricultural economists, Office of Transportation, U.S. Department of Agriculture)

"Agriculture in a World Setting" is the theme of this conference, and it is transportation that makes such a theme relevant. World trade in agricultural commodities has grown from 193 million metric tons in 1974-75 to 260 million in 1978-79. The 1979-80 projection is 274 million metric tons. The share of this trade coming from the United States grew from 45 percent in 1974-75 to 49 percent in 1978-79, and is projected to be 53 percent in 1979-80.

A major factor in the expected increase in U.S. exports in 1979-80 is that of logistics problems in countries that in the past competed strongly with the United States for foreign outlets. Canada, in particular, is reported to be experiencing major problems in marshaling adequate inland transportation capacities for moving grains to ports. Thus, U.S. farmers gain markets by experiencing fewer transportation difficulties than do their competitors. This may be less than comforting to those U.S. shippers who have products for sale but who have experienced inabilities to get products to ports on a timely schedule at reasonable cost.

Since the fall of 1977, grain, soybean, and cotton shippers have reported that on many occasions they use their second and third transportation choices. The growth in export demand for commodities, along with two successive winters of harsh weather, explain some of these service deficiencies, but there have been other contributing factors as well. Bankruptcies of the Rock Island and Milwaukee Railroads, strikes lasting several weeks by the grain handlers at Duluth and Superior elevators and by the railway unions on the Rock Island, explosions at several export elevators, and shortages of diesel fuel have strained the transportation system.

We will comment briefly on the situation in agricultural transportation, and review some of the ongoing developments for which resolutions will affect the adequacy of transport services in the year ahead.

MOVEMENT TO EXPORT

In keeping with the theme of the conference—in fact, there is no other logical way to begin this talk—we look first at the movement of grains, soybeans, and other commodities to ports. The previous session of this Outlook Conference dealt heavily with exports by commodity, so we will focus largely on the aggregate volumes that must be moved to ports and overseas markets.

In 1971-72, the volume of U.S. agricultural exports was 61 million metric tons. The volume exceeded 100 million metric tons for the first time in 1975-76. In 1979-80, we expect the volume to reach about 145 million metric tons—17.1 million metric tons above 1978-79.

In recent years, particularly in 1979-80, the Soviet Union has been the major source of trade to boost U.S. exports. The expected wheat crop for the U.S.S.R. is 38 million metric tons below that of 1978-79, and the estimated coarse grains production is down 23 million metric tons.

Between 1971-72 and 1972-73, exports increased 39 million metric tons—nearly 65 percent. Much of that increase was due to purchases by the U.S.S.R. The second largest relative increase was in 1975-76 when exports exceeded those of the previous year by 22 percent. The way transportation has accommodated itself to those high increase percentages make the expected 13 percent increase in 1979-80 seem manageable; the latest increase comes on top of the others.

Table 1 shows metric tons exported in the 1978 fiscal year and forecast tons for fiscal year 1979. Also shown are projected tons for 1979-80. Grains, soybeans, and their products contribute about 98 percent of the agricultural commodity tonnage going to foreign buyers. They contribute considerably less in terms of value.

In 1978-79, U.S. exports of grains and oilseeds accounted for half of all world trade in these commodities. In 1979-80, the U.S. share is projected at 54 percent. For both years, U.S. share of world cotton trade amounts to 32 percent.

Transporting grains and soybeans

Railroads and water carriers deliver most of the grains and soybeans to ports. For 1977, 1978, and the first 9 months of 1979, figure 1 shows bushels loaded on barges (weekly); figure 2, bushels loaded on railcars (4-week periods); and figure 3, bushels inspected for export (monthly).

TABLE 1.—U.S. AGRICULTURAL EXPORTS: VOLUME OF SELECTED COMMODITIES, 1977-78 AND 1978-79, AND PROJECTED FOR 1979-80

[In million metric tons]

Commodity	Fiscal year—1		Projected for 1978-80
	1978	1979 ²	
Wheat and flour.....	32.8	32.3	³ 38.1
Feed grains.....	55.5	60.6	³ 71.1
Rice.....	2.1	2.4	³ 3.8
Soybeans.....	19.7	20.5	³ 22.5
Vegetable oils.....	1.5	1.6	⁴ .9
Oilcake and meal.....	5.8	6.3	³ 6.4
Cotton, including linters.....	1.4	1.4	³ 1.3
Tobacco.....	.3	.3	NA
Fresh fruit.....	1.3	1.3	NA
Animal fats.....	1.3	1.2	NA
Total.....	121.7	127.9	⁴ 145

¹ Source: U.S. Department of Agriculture, Outlook for U.S. Agricultural Exports, Aug. 17, 1979.

² Forecast.

³ Projected, crop-year basis. Source: U.S. Department of Agriculture, Agricultural Supply and Demand Estimates, USDA 2404, Oct. 15, 1979.

⁴ Projected, fiscal year basis.

Analysis of these series for 1975 to present determined that a 10-percent change in inspections for export was accompanied by only a 3-percent change in the number of bushels loaded in railcars. Period-to-period changes (equating the first six and last six of the 4-week periods in the year to the months of the year) showed that rail loadings and inspections changed in the same directions 39 times out of a possible 55; in opposite directions 10 times; and one of the two series had no changes for six comparisons.

BARGE SHIPMENTS OF GRAIN, INTERIOR RIVER POINTS, 1977-79.

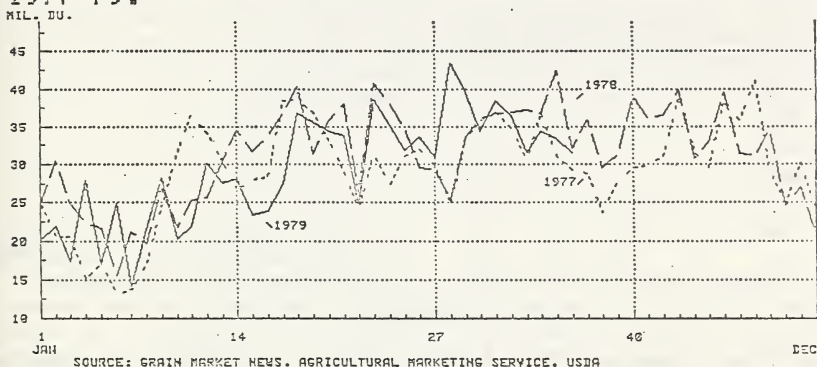


FIGURE 1

Barge loadings reflect some growth over the 33 months shown in figure 1. Due to winter freezes that affected the barge loading series, no special analysis was made of short term relationships between barge loadings and inspections for export. Also, barge transit is long distance in most instances, and round trips for barges take much longer than round trips for unit trains. Therefore, knowledge of appropriate lags to build into the comparisons would be needed to develop a meaningful analysis for barge loadings.

RAIL SHIPMENTS OF GRAIN CONSECUTIVE 4 WEEK PERIODS, 1977-79

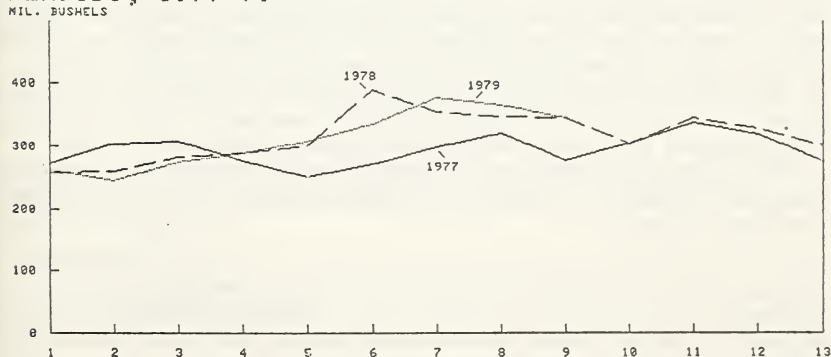


FIGURE 2

In the period between January and September 1979, barges moved 1.15 billion bushels of grain compared to 1.23 billion in the same period of 1978, and 1.15 billion in 1977. The late spring thaws of 1979 may be responsible for this downturn.

INSPECTIONS OF GRAINS FOR EXPORT, MONTHLY, 1977-79

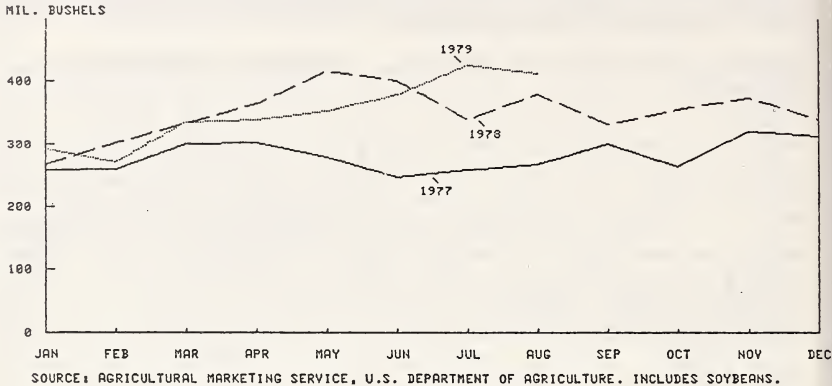


FIGURE 3

Three domestic transportation problems in particular threaten to make it more difficult and costly to increase exports of grains and soybeans. These are the bankruptcies and potential liquidation of certain Granger railroads, continuing shortages of railcars suitable for grain loading, and imminent capacity constraints on the Upper Mississippi River at locks and dam 26. According to a recent analysis by the Economics, Statistics and Cooperatives Service, port facilities also could prove to inhibit further expansion in the shortrun.

Railroad bankruptcies

At present, the Rock Island Railroad is both on strike and in bankruptcy. The Interstate Commerce Commission has directed the Kansas City Terminal Railway Co. to provide service for shippers located on Rock Island properties. But this is an emergency action and may not be sustainable. The Rock Island is having cash flow problems. There also is some evidence that no part of the total system could be a viable core for future operations. Thus the system may require liquidation.

The Milwaukee Railroad is also bankrupt and has cash flow problems. The trustee has identified a viable core in the Corn Belt, but has proposed disposing of all trackage west of Miles City, Mont.

The following tabulation shows thousands of railcar loadings of grain for these two railroads in relation to the total of national railcar loadings of grain:

Year	Railroad		All
	Rock Island	Milwaukee	
1975.....	99	61	1,343
1976.....	86	58	1,323
1977.....	87	52	1,241
1978.....	95	64	1,341

Source: Association of American Railroads.

Car shortages

Grain is storable and subject to substantial investment risks. Prices of grain are volatile. Rail service is not storable, but the capacity to provide service is also subject to substantial investment risks. Railroad rates tend to be inflexible in the shortrun, particularly because of Federal regulations. The rates for moving grain interstate by truck and in bulk by water are unregulated. At times, the railroads do not have sufficient capacity on hand to meet all immediate demands for service from the grain industry. According to grain shippers, car shortages have existed since late 1977.

Data showing railcar shortages or surpluses are not publicly available for most of 1979. But past relationships between railcar loadings and car shortages suggest that present shortages must be substantial. Railcar loadings and inspections for export have been running at relatively high levels. Slowdown in the general economy may release some cars suitable for grain loading that could be used in meeting export demands. Car builders have backlog orders, some of which were intended for use by commodities other than grains. But, as now forecast, 1979-80 exports are much larger than those of 1978-79, so railcar shortages will probably continue.

Among the railcars used for grain loading are 40-foot, narrow-door boxcars and both small and jumbo covered hopper cars. Based on data from the Association of American Railroads, the long-term trend toward covered hopper cars for grain hauling has been somewhat stable since 1977. The following tabulation shows trends in car types:

Period	Carloadings of grain (percent of cars loaded)		Volume of grain loaded (percent of grain loaded)	
	Covered hoppers	ND boxcars	Covered hoppers	ND boxcars
1972-----	51.9	48.1	61.8	38.2
1973-----	48.7	51.3	58.7	41.3
1974-----	62.7	37.3	74.1	25.9
1975-----	73.6	26.4	82.6	17.4
1976-----	78.6	21.4	86.2	13.8
1977-----	80.5	19.5	87.5	12.5
1978-----	78.2	21.8	85.9	14.1
1979 (9 mo)-----	78.1	21.9	85.8	14.2

The aberrations occurring in 1973, 1978, and 1979 are thought to be due to severe shortages of jumbo hopper cars in these years.

Despite the increased use of narrow-door boxcars for grain hauling in 1978 and 1979, ownership of these small-volume cars continues to decrease, and is expected to decline nearly 20 percent by 1981. Small covered hopper car ownership is declining also. Both railroads and shippers are increasing their ownership of jumbo covered hoppers, but shippers are increasing their ownership more rapidly than are railroads (figure 4).

Locks and dam 26

Many grain shippers have expressed the opinion that the economical capacity of locks and dam 26 is likely to prevent any substantial increase of barge movements above current levels. Locks and dam 26 is just below the confluence of Illinois and Mississippi Rivers. Grain barge movements southbound through this facility increased from about 750 million bushels in 1973 and 1974 to nearly 1 billion in 1978.

Congress has authorized replacement of the facility, but progress on construction has been delayed by judicial investigation of environmental factors. Also, Congress has authorized the initiation of waterway user taxes to begin in October 1981. Combined together, these factors may dampen the willingness of carriers and/or shippers to invest in new barges and towboats.

Ports and ocean shipping

The U.S.S.R. receives most imported grains through Black Sea ports. This suggests that most of the increased exports to the U.S.S.R. in 1979-80 will move through Gulf and Atlantic ports. However, Great Lakes ports may receive some of this extra tonnage. Japan and other Asian customers may take more of their purchases through Pacific ports, thereby helping to relieve any congestion at the Gulf ports.

Ocean shipping for grains and soybeans has been in plentiful supply since 1974, and will likely be plentiful in 1979-80 unless bunker supplies are disrupted. In early 1979, bunker supplies became somewhat uncertain after the disruption of crude oil supplies from Iran, but conditions have improved since then. Ocean charter rates for grains escalated about 50-60 percent for April-June over those prevailing during the first quarter of 1979. U.S.-flag vessels, likely to be required for some of the increased U.S.S.R. trade, are in short supply.

GRAIN CAR OWNERSHIP

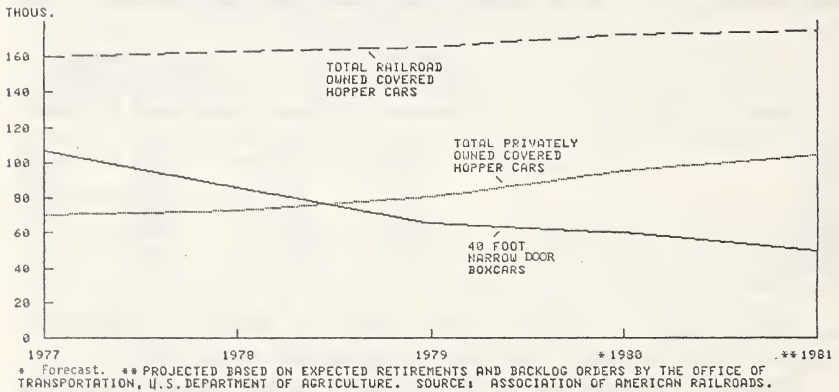


FIGURE 4

Cotton

Exports of cotton fiber are expected to increase slightly above the 1.4 million metric tons forecast for export in 1978-79. However, more of the 1979 production—about 77 percent—is in the West and Southwest, long distances from both Gulf ports and eastern mills. This, along with grain shippers' strong demand for any rail equipment that can be used for grain, may cause the narrow-door boxcar shortages that have plagued cotton shippers since early 1978 to continue to 1979-80.

MOVEMENTS TO DOMESTIC OUTLETS

Feed grains, grain mill byproducts, and oilseed cakes and meals

Feed grains, grain mill byproducts, and oilseed cakes and meals are heavily used in feeding livestock in locations other than on the farms where they are grown. Nonetheless, both cattle and hog feeding occurs primarily in areas with heavy feed grain and oilseed production. These are the livestock species that reflect the greatest variability in production levels for year-to-year.

Beef production was 11 percent lower in 1979 than in 1978, but pork and poultry production more than offset this decrease. Pork is produced primarily in Corn Belt States, and corn and protein supplements required only local movements. Poultry is heavily produced in Southeastern and Delta States, and requires the movement of both corn and protein supplements over relatively long distances. However, if broilers require 2 pounds of feed for each pound of ready-to-cook meat, the increased production of 1.07 billion pounds in 1979 required less than 1 million metric tons of feed grains and other feed ingredients. In 1979-80, increased exports of corn alone are projected to be more than 8 million metric tons.

Perishables

If one wants to assess how transportation requirements of agriculture are changing in only aggregative terms, one need simply assess changes in exports. But agricultural transportation requirements may need to be assessed in other ways also. The perishable commodities going to domestic outlets demand different transportation capacities than do the semiperishable grains, oilseeds, and fibers. Water carriers are insignificant as movers of perishable commodities, and the railroads are largely out of the business.

Perishables add up to about 100 million metric tons per year—in order of volume: Fluid milk, red meats, potatoes, fresh vegetables, fruits, and poultry and eggs. Except for milk in bulk, all of these products utilize refrigerated, insulated trailers. The versatility of these vehicles, and the regulated or unregulated status of various perishable commodities provides a competitive setting in which unexpected disruptions can occur in their flow. Rate flexibility permits rapid adjustments for commodities that are not regulated by the Interstate Commerce Commission. But red meats are regulated and have suffered many disruptions in recent years. However, the unregulated commodities were also disrupted in May and June 1979, when shortages of diesel fuel and other conditions caused those independent truckers who lacked the authority to haul regulated commodities for their own accounts to cease operations. They also blockaded some truckstops, and erupted into violence in a few locations. These conditions caused a rapid escalation in truck rates for product shipments to about double the rates that applied just prior to the disturbances. However, data on shipments from producing areas indicate that these conditions made only modest impacts on truck shares and little or no overall impact on movements (table 2).

The administration created two working parties to consider the legitimate problems of independent truckers. USDA has begun to report

truck charges for produce on a weekly schedule, and cost per mile of operating refrigerated trucks monthly. These reports were requested by truckers. In addition, the Secretary has submitted a report to the President that recommends actions to establish contract of haul regulations for produce. The Secretary of Transportation also has submitted certain recommendations, and the Interstate Commerce Commission has instituted fuel price increase surcharges that are passed through to permanently leased independent truckers. These several actions should improve conditions in the year ahead.

TABLE 2.—SHIPMENTS OF FRESH FRUITS AND VEGETABLES BY MODE OF TRANSPORT, 1977 AND 1978, AND MONTHLY 1979

[Weekly averages in thousand hundredweights]

Year	Rail	Truck	Total	Rail share (percent)
1977.....	1,552	6,596	8,148	19.0
1978.....	928	6,830	7,758	11.2
1979:				
January.....	866	6,905	7,771	11.1
February.....	870	6,433	7,303	11.9
March.....	1,063	7,387	8,450	12.6
April.....	1,125	7,824	8,949	12.6
May.....	1,132	8,744	9,876	11.5
June.....	2,388	8,735	11,123	21.5
July.....	1,192	7,609	8,801	13.5
August.....	-----	-----	-----	-----

Source: Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture. Agricultural Outlook, AO-46, p. 78, and AO-47, p. 25.

Movements of fertilizer

Fertilizer is very seasonal in its use as an input into farming. The spring planting season causes congestion in the fertilizer handling and transporting systems. Warehousing in farm production areas helps spread the transportation burden over a longer season, but, nonetheless, sharp surges occur in late winter and spring. These increases often require special allocations of transport equipment. At times, covered hopper cars are removed from grain transport to help meet the needs for fertilizer movements.

Phosphate and potash nutrients are found in only a few geographic points in North America. These are long distances from the areas of heavy use in Corn Belt and Pacific States. Nitrogen nutrients are produced closer to farming areas. Table 3 shows tonnages of various materials produced in 1977 and 1978. Only a few items showed substantial changes in production between 1977 and 1978.

TRANSPORTATION COSTS

In September 1979, rail freight rates for farm products were 136 percent above their 1969 level. Increases of about 7.5 percent for domestic grain movements and about 11 percent on movements to ports have recently gone into effect. The fuel surcharges in 1979 have also accumulated to about 5 percent. The continuing tight supplies of both diesel fuel and transportation equipment in the 1979-80 crop year portend further rate increases. However, we cannot offer specific projections of 1980 rate levels.

Truck and barge rates are unregulated and are therefore unpublished. Shipper reports suggest that these rates are high in relation to mid-1977 levels.

OUTLOOK FOR 1980 AND BEYOND

The transportation system serving agriculture has been under stress since late 1977, and the expected increase in exports in 1979-80 will cause the stresses to continue. But as the high exports improve farm income, they also provide opportunities for increased revenues to carriers. The flexibilities inherent in our multimodal transportation networks make it possible to increase exports. The cost of achieving export increases has already changed through the cost increases that are implicit in using second or third choices of transport and through the relatively higher rate increases for export modes that have occurred recently.

TABLE 3.—PRODUCTION OF NITROGENS AND PHOSPHATIC FERTILIZER MATERIALS AND PHOSPHORIC ACID, UNITED STATES AND MURIATE OF POTASH, UNITED STATES AND CANADA, YEARS ENDING JUNE 30, 1977 AND 1978

[Amounts in thousand tons]

Material	1977	1978	Change (percent)
Nitrogenous fertilizers:			
Anhydrous ammonia.....	16,791	17,490	+4
Ammonium nitrate, solid.....	3,273	3,051	-7
Urea.....	3,982	5,022	+26
Nitrogen solutions.....	2,370	5,282	+9
Ammonium sulfate.....	2,489	2,333	-6
Phosphatic fertilizers:			
Normal and enriched superphosphate.....	361	290	-20
Concentrated superphosphate.....	1,746	1,778	+2
Diammonium phosphates.....	3,253	3,714	+15
Other ammonium phosphates.....	821	893	+8
Other phosphatic fertilizer materials.....	230	283	+23
Total phosphatic fertilizers.....	6,411	6,958	+9
Wet process phosphoric acid.....	7,750	8,161	+5
Muriate of potash:			
United States.....	2,260	2,294	+22
Canada.....	6,234	6,842	+10

Source: Economics, Statistics, and Cooperative Service, U.S. Department of Agriculture, Outlook Situation 85-9, December 1979, p. 90.

Agriculture shares our complex transportation system with other sectors of the economy. The relative easing of demands by the rest of the economy that appears likely for the next few months may permit the release of some equipment suitable for use by agriculture, especially new covered hoppers ordered for other sectors.

The task of moving the volumes needed for domestic use and of moving 145 million metric tons of agricultural commodities to ports in 1979-80 is achievable. But shippers will have to be vigilant to seize opportunities as they arise. Also, carriers will have to seize opportunities for improving equipment utilization.

Looking ahead to 1981 and future years, several ongoing efforts may prove helpful in expanding the capacity of the agricultural logistics system. Among them are: a restructuring of certain midwestern railroads under the Railroad Revitalization and Regulatory Reform Act of 1976; a review of problems and opportunities in agricultural transportation by the Rural Transportation Advisory Task Force; and

regulatory reform and other administrative and legislative activities at the Federal level; efforts underway to make State rules and regulations affecting interstate truck transportation more uniform; and a growing recognition that transportation trust funds must be replenished through taxing schemes that will keep revenues in balance with needs of the governmentally provided transportation networks.

TRANSPORTATION—GENERAL: HOW IT AFFECTS ALL OF US

(By W. W. Imboden, traffic manager, Indiana Farm Bureau Cooperative Association, Inc.)

Whether we realize it or not, we are all highly dependent on all modes of transportation but especially on rail and motor. Much industry depends on water transportation for both domestic and export shipments. Specialized transportation—as an example, the movement of perishables require special equipment. All of this is taken for granted by the American public, and only when something unforeseen suddenly curtails the movement of freight do we realize the importance of our transportation system.

No segment of our society is more dependent upon transportation service than agriculture. The Department of Transportation and its recent preliminary analysis of the railroad industry predicts that the railroad industry will face a capital shortfall of \$13 to \$16 billion by 1985.

Much of the freight by nature and source can only be moved economically by one mode or in some instances by a combination of two modes such as rail-water. The consistent large-volume, long-haul moves generally are not practical via truck, and in fact on such moves the consignee normally maintains an inventory at his facility, plus he will always have an in-transit inventory.

RAIL

The railroads must develop new innovations in the 1980's. New innovations which will result in better utilization of railcars is particularly important. This is presently being done in some instances and is generating more revenue for the railroads, and better utilizing the covered hopper cars leased by industry. Most railroads have very sophisticated computers which will quickly provide one with considerable information; however, in too many instances cars are delayed in yards or fail to get on the proper cut, resulting in numerous delays.

Runthrough trains without the necessity of power changes has proved quite successful and speeds up transit time. Changes in work rules allowing railroads more freedom of operation would definitely improve service.

For years the railroads moved a large volume of the small shipments but elected some years ago to discontinue this service. Possibly this is a service which could be reinstated between certain cities where there is a large daily flow of such shipments where the next-day delivery could be accomplished. A study of this would be interesting.

Insofar as the movement of passengers by rail is concerned, we have a lifestyle that must change before this will in my opinion ever again become a reality to any appreciable degree. During World War II, the railroad performance was outstanding in the movement of military personnel. Subsequently, the airlines and automobiles have captured a large percent of both long- and short-haul passengers, with the railroads gradually phasing out of the passenger business. Amtrak was created at a huge expense to the Government with service offered in some areas without any or many preliminary studies to determine the practicalities of such service. Because of continued losses, much service is being discontinued. There are certain areas in the country where all rail passenger service could recapture the business if ontime service, on good roadbeds via high-speed trains, was offered.

MOTOR CARRIERS

Motor carriers have a much greater flexibility than any other mode. Also, they do not have the terminal delays experienced by railroads. They are restricted in weight-carrying capacity by the various State laws. There are those who believe weight laws should be identical for all States, but to me this does not seem completely practical due, among other things, to the varying terrain and climatic conditions. The weight restrictions plus the fact that each truckload of 40,000 pounds to 44,000 pounds requires another power unit makes this mode a high user of energy.

Many of the common and contract carriers have over the years sought and been granted the authority for one-way movements of freight with no authority to haul products on the return trip, resulting in considerable deadhead mileage. The cost of such deadheading by necessity had to be built into the rate. This is a situation which should be corrected to help alleviate energy consumption.

WATER TRANSPORTATION

This mode does offer substantial savings to many industries. Large volumes can be moved to and from ports for export and import, which is particularly important to the agricultural industry. U.S. agriculture must constantly have markets for its huge grain production, and water transportation is valuable in the overall transportation scheme. This is in no way meant to discredit the other essential service modes who likewise play an important role.

Water routes between two points are many times highly circuitous when compared with other modes, and this results in greater use of fuel.

It has long been debated—and will continue to be debated—whether the modes competing with water help to subsidize a competitor. Far be it from me to attempt an answer to this question. I do feel, however, water is an important mode to our overall transportation system.

ENERGY CONSUMPTION

No doubt I think more about this subject when paying for fuel oil to heat my home. But let's discuss it chiefly as regards transportation.

An article I recently read discusses energy consumption by surface modes as well as air. This tells us that the Btu consumption per freight ton-mile is as follows:

	<i>Btu's</i>
Railroad -----	670
Waterways -----	680
Truck -----	2,800
Aircargo -----	42,000

Further, from what I have gleaned, railroads use 3.27 percent of the petroleum consumed in U.S. transportation each year, while highway vehicles of all types account for nearly 85 percent of the total transportation consumption. No doubt much of the fuel consumed on the highway is in automobiles carrying one passenger. Hopefully, our scientists shall ultimately discover some new fuel to alleviate the critical oil situation. If not, we will probably see some very curtailing restrictions imposed.

REGULATION VERSUS DEREGULATION

There are many different thoughts and views on this subject. The railroads favor deregulation, and the American Trucking Association representing the motor carrier industry is quite outspoken in behalf of continued regulation. It is my belief some regulatory reforms giving carriers relief in some areas would be in order but not complete deregulation.

Think back to the beginning of rail regulation in 1887 and what originally brought it about. We had some unscrupulous operators then, and I leave it to your judgment what the situation might be today without regulation.

There are many small communities in agricultural areas throughout the country that must have an available transportation service. Rail service, by virtue of abandonments, is no longer available, and motor carrier service has declined. Unless motor carriers are required as a condition in the holding of their authority to serve such communities, they stand to suffer.

Without some regulation, to whom could we turn if redress is sought?

Additionally, I feel we would have many rate wars among carriers—particularly among motor carriers—which would force many of the vital small operators out of business.

Further, with few exceptions, I believe equality of treatment among carriers is of the utmost importance.

SUMMARY

Up to this point, I've discussed numerous things and expressed opinions on some matters. Now, let me summarize some points which I believe are important in Outlook 1980 insofar as agricultural transportation is concerned.

1. New innovations by railroads.
2. Improvement of service and faster turnaround time on railcars.
3. Increase of railroad-owned car supply.

4. Where possible, establishing uniform State weight restrictions.
5. Allowing motor carriers now holding authority more flexibility to eliminate deadhead movements.
6. Regulatory reform rather than deregulation.

DISCUSSION ON TRANSPORTATION

(By Byron Nupp, Assistant Director, Office of Intermodal Transportation,
Department of Transportation)

J. O. Gerald's impressive statement of the problems in current agricultural transportation proves once and for all that no other sector in the American economy excels agriculture in its experience with the transportation system. And hardly any other sector is more forthright in its expression of views and opinions about its transportation experience.

Despite the vast sweep of experience and knowledge in the agricultural community about transportation, the paper by Gerald documents a chronic condition that can be described best by two words: crisis and improvisation. These words could be emphasized by defining them as recurring crisis and continuing improvisation.

Several other major transportation problems appear to operate in a more structured environment in meeting problems of growth and change:

1. The airlines, airport authorities, and airway system controllers appear to have cooperated, with some hitches, in expanding service and meeting sensitive problems such as airport security.

2. The highway interests have responded constructively in meeting the need for improved service and increased capacity.

3. Urban commuter services, although far from perfection, are moving in the direction of multimodal service through combined Federal and State and local policies.

4. More recently, the problem of energy transportation has been given structured attention by a variety of Federal agencies, energy consumers, and transportation industries.

What are the factors that continue to thrust crisis and improvisation at the agricultural transportation problem? And you may say, "So what? Have we not in the end always moved the stuff despite the trouble and recriminations?"

The same conditions which have made it necessary to tolerate crisis have enabled us to get away with it, so far.

1. There has been overcapacity in both transportation and agriculture. J. O. Gerald remarked that in the current situation many shippers have been forced to rely on their second and third choices of transportation capacity. Surely an interesting way of describing the impact of the excess capacity in the system.

2. There is decentralization and pluralism in both agriculture and transportation. Agriculture has both commodity sectors and geographic dispersion. Transportation has modal divisions and geographic separations.

3. In both fields, public policy institutions and responses are loosely structured. We have extensive regulation alongside free market situations. We have very specified program promotions which we try to fit within broad national policy objectives.

The question arises: Will improvisation continue to be a workable solution for agriculture?

1. Surplus in transportation may be disappearing, driven by the combination of two forces: (A) Secular economic growth which has absorbed some capacity, and (B) economic adjustments in excess capacity illustrated by rail bankruptcy, line abandonment, car service deficiencies, periodic crises in exempt truck capacity.

2. There may be impending changes in the overall agricultural economy, particularly production and marketing objectives, and the long-range prospects of foreign demand.

It seems likely that in the future, the agricultural and transportation interests will have to get together to work out a more structured approach to the recurring problems and crises. There will be two ingredients to this structured process:

1. Joint assessment of long-term goals. Certainly one of these should be an anticipation of changes in national production and marketing processes in the agricultural sector. Another would be the prospects of world trade in agriculture in the longer term.

2. Provision for specified improvements in transportation capacity and services to meet reasonable agricultural goals.

Several transportation issues come to mind in this connection:

1. Development of ports over the long term to meet the growth and changing characteristics of foreign markets.

2. An understanding of the kind of rail capacity that will be needed to meet the changing goals of agriculture, such as numbers and kinds of railcars, their operating doctrines, and the manner in which agriculture will share the capacity with other sectors.

3. Rate, service, and regulatory policies associated with the use of transportation for agricultural goals.

4. Economical use of trucks and barges, and the relation of this use to other transportation modes.

5. Research and planning agendas associated with agricultural transportation. The pioneering work by Baumol et al. at Iowa State University is an example of the kind of overall research that may be needed.

6. Transportation promotional policies consistent with agricultural goals. Lock and dam 26 was mentioned as a facility impacting agriculture. There is a strong agricultural interest in various maritime policies. Roads and rural life are interrelated bases for social policy.

Now, even though I believe that agricultural transportation will evolve into a structured system, I see no need for a highly developed planning bureaucracy or an institution of elaborate written plans. We need to cultivate a community of interest that will combine economic incentives, operational and investment decisions, and Federal policies. Such a process can be very effective as shown in other areas of economic life, including other transportation sectors.

Changes are occurring everywhere in policies and institutions affecting transportation and agriculture. New regulatory philosophies are

in the air. New transportation programs are developing. New problems are emerging to test our abilities. New tools of analysis and new scientific applications will assist us.

We increasingly recognize that the comparative advantage of U.S. agriculture is an important national asset: a contributor both to economic stability and to the welfare of the United States in an international economy. The great objectives of the agricultural community in the United States can be realized. The transportation sector is obliged to act constructively to assist in their achievement.

As a service industry, transportation cannot improve its processes without constructive communication from those it is supposed to serve. We must remove the air of crisis and improvisation, and find a better way of doing business.

DISCUSSION OF A PAPER ENTITLED TRANSPORTATION, 1980

(By L. O. Sorenson, Kansas State University)

Gerald and Tosterud have done a splendid job of bringing into focus those predictable factors that will influence the aggregate demand/supply balance for agricultural transportation in 1979-80, especially as it relates to movement of products to export ports. To my knowledge, this represents pioneering work of sorts. I am not aware of previous systematic evaluation of future shortrun prospects for agricultural transportation. Shippers, especially small shippers, have frequently had unpleasant surprises in seeking services in the past. This type of effort will reduce the frequency and range of surprises for shippers seeking services of for-hire carriers in a very diverse and unpredictable transportation system.

The authors state that "to assess changing transportation requirements of agriculture in aggregative terms only, about all that is required is to assess changes in exports." Since "grains, soybeans, and their products contribute about 98 percent of the tons of agricultural commodities going to foreign buyers, * * *" aggregate analysis of annual changes in agricultural transportation rightly focuses on export prospects for grain and soybeans.

Expanding export markets for grain and soybeans will most certainly result in continued expansion in requests for services from the for-hire elements of the transport system. By mode, increased demand will be placed on rail and barge transport as a result of projected increases in number of covered hopper cars in 1979-80 of about 6.5 percent over 1978-79 and pending improvements in facilities for navigation on the Mississippi River. However, projected rate of increase in number of covered hopper cars is less than half the expected rate of increase in exports of grain, soybeans and their products and navigation improvement at lock and dam No. 26 will not be completed until after 1980. The authors conclude that "* * * if 1979-80 exports are as much larger than 1978-79 as now forecast, railcar shortages likely will continue * * *"

I agree with this evaluation. Gerald and Tosterud suggest also that a 13-percent (18.3 million metric tons) increase in export tonnage is manageable based on the capacity of the transport system to handle a 65-percent (39 million metric tons) increase in 1972-73 and a 22-percent (18 million metric tons) increase in 1975-76. I agree with this conclusion also. If export orders for grain, soybeans and their products increase by 18.3 million metric tons in 1979-80, I believe we will find a way to move that volume of grains to ports if ocean-shipping capacity is available as it is likely to be. The question is, where does the increased transport capacity in major grain export

corridors come from? Is railcar and barge utilization improved to an extent that a substantially larger volume of grain is moved with existing and modest new additions to existing equipment? Does substantially greater use of second- and third-choice facilities (that is, smaller railcars or truck substitution for rail) occur throughout the system? Or are railcars diverted from small local shippers to major export corridor movements placing much of the burden of freight car shortages on local shipment and smaller volume shipments to domestic users?

I doubt that any of us has conclusive evidence of the pattern of impacts of rail freight car shortages, however, I suspect that impacts are relatively more severe for smaller shippers with the fewest alternatives. Rail freight cars for shipment of grain became in short supply in the early months of 1978 and still remain short. In spite of tight supply Gerald and Tosterud report railcar shipments of grain in the first five 4-week periods in 1978 that were approximately equal to railcar shipments in the same period in 1977 (data for fig. 2). Annual railcar shipments of grains and soybeans for 1978 were about 6 percent above 1977. However, the manager of a cooperative elevator headquartered at Hays, Kans., and representing five elevators at different locations in that western Kansas, High Plains area reported to the U.S. Senate Committee on Agriculture and Forestry [1] in May 1978 that his five elevators received a total of 484 freight cars for loading in the first 4 months of 1977 and 133 in the first 4 months of 1978. Nationally, railcar loadings were approximately 100 percent of 1977, yet Mr. Herman received only 27 percent of the number of cars received in 1977 and only 17 percent of the number ordered. Mr. Herman indicated in committee testimony that his elevators were not unique but instead were typical of conditions reported by other elevator managers in the High Plains in the spring of 1978. Railcar delays were costing more than \$34,000 per month at the five elevators in interest charges on unexpected inventory and in late-delivery penalties imposed by grain purchasers.

If this apparent differential impact among shippers of railcar shortages is characteristic, financial impacts of railcar shortages fall heavily upon local shippers and the producers they serve. According to Mr. Herman, "whether we pass on these costs directly, by reducing the bid price or indirectly through reduced savings for our members, the grain producer's income suffers."

In any case further analysis of impacts of changes in aggregate transportation conditions on specific transportation markets would provide more precise insight into the effects of demand/supply imbalance in transport markets. Transportation supply conditions are severely local, varying in type of transportation available and in quality of service made available by carriers serving each market. Understanding relationships between local market conditions and changes in the aggregate demand/supply balance must be refined as transportation outlook moves forward.

Gerald and Tosterud indicate several supply-related situations that have influenced agricultural product movement in 1979-80. These include: Shortages of diesel fuel; railroad, truck and dock strikes; harsh winter; heavy movements of industrial products; directed diversion of freight cars; and railroad bankruptcies. Some of these are fairly

frequent and are somewhat random events, for example, strikes and harsh winter, some of which may be expected to occur nearly every year. Others are continuing conditions that will influence the transportation industry's supply of services to agriculture in the short run—next year—and in the longer run. I would like to comment on two of these conditions, namely; (1) the financial condition of railroads and possible policy responses thereto and (2) fuel cost and consumption in transportation.

Current bankruptcy and possible liquidations of the Rock Island and the Milwaukee in 1980 will affect agricultural transportation supply in 1980, especially supply of grain transportation. The main paper indicates that "The Rock Island is not a major originator of grain * * *" however ensuing data indicate that about 7 percent of total grain originated nationally in a 4-year period, 1975 through 1978, originated on the Rock Island despite the fact that the railroad was in bankruptcy during most of the period. The Rock Island originates 15 percent of all rail wheat shipments in Kansas [2] and provides major direct routes to the gulf and the Southwest, making it an important grain carrier, in my judgment. The Rock Island is an extremely important grain carrier to those elevators on approximately 1,000 miles of rail line in Kansas most of which are served exclusively by the Rock Island. Together, the Rock Island and the Milwaukee originated about 11.5 percent of all rail grain shipments in the 1975-79 period and probably had potential for greater volume under more viable financial conditions. As indicated by Gerald and Tosterud, operation of neither railroad may be sustainable throughout 1980 which will detract significantly from available rail supply of agricultural transportation service.

In the longer run, the condition of the Rock Island and the Milwaukee are indications of what may happen to larger portions of the rail system unless policy options are exercised that will reverse the shrinking capability of railroads to serve agriculture. Railroads have been moved rather dramatically in the direction of serving a small number of routes of high traffic density in recent years, and have become primarily haulers of bulk materials. Efforts to cut cost in rail transport to compete with truck and barge carriers has emphasized mainline, trainload movement. Reduced regulatory control over the rail system will likely accelerate that evolution unless it is accompanied by changes in operating environment for railroads that will provide greater opportunity to develop and introduce cost-reducing techniques. Policy developments in 1980 will be extremely important in determining the kind of service to agriculture to be provided by the railroad industry in the future. It is encouraging that the U.S. Department of Agriculture is providing an active input into policy determination through the Advisory Task Force on Agricultural Transportation.

Fuel cost and availability of supplies caused disruptions in agricultural transportation in 1978-79. There can be little doubt that changes in the supply climate for petroleum fuels in 1980 will affect agricultural transportation characteristics and costs in 1980.

Nowhere are the impacts of fuel shortage more direct or more universal than in transportation. Transportation consumes 54 percent of

total energy consumed in the United States. More than half (53 percent) of transportation energy is used for automobile travel. The Federal Highway Administration estimates [3] that 42 percent of automobile vehicle-miles by rural households (those in unincorporated places) is for purposes of earning a living; 22 percent is for family business; 6 percent is for educational, civic, and religious purposes; and 29 percent for social and recreational purposes.

In agricultural freight transportation, further curtailment of fuel supplies likely to occur in 1980 will affect truck transportation most directly. Trucks are major movers of domestic agricultural freight. Gerald and Tosterud indicate movement of agricultural perishables that total 100 million metric tons per year. This compares with estimated export of grains, soybeans, and their products of only 113 million metric tons in 1979-80.

Increased fuel costs in 1980 may result in disruptions similar to those occurring in 1979. In the short run, the major effect will be increased costs to shippers. Gerald and Tosterud present evidence that elasticity of demand for agricultural freight service is very low in the short run. In the longer run, fuel constraints will result in a search for, and increased use of, the least fuel-intensive type of transportation and efforts to conserve energy through more efficient use of existing transportation investment and technology. Productivity in freight transportation is enhanced when roadway, vehicles, and terminal capacities are matched to avoid delays or excess capacity, when the ratio of payload to gross weight is high, when container vehicle capacity is matched with the capacity of power units, when continuous movement can be maintained, when minimum distance routing of shipments can be attained, when supply of services matches shippers need, and when capital equipment and personnel are fully utilized.

Efficient performance in transportation frequently means economizing on energy use. Expanded understanding of transportation system economics including refinements in analysis of outlook for transportation will contribute to transportation efficiency.

REFERENCES

1. Statement of Kenneth Herman, Hays, Kans., before the U.S. Senate Committee on Agriculture and Forestry, Subcommittee on Agricultural Production, Marketing, and Stabilization of Prices, May 1978.
2. "Wheat Shipments from Kansas, 1972-73," prepared for Transportation Systems Center, U.S. Department of Transportation, December 1974. Kansas Agricultural Experiment Station contribution No. 575.
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AN ALCOHOL FUELS PROSPECTIVE: THE NATIONAL
ALCOHOL FUELS COMMISSION

(By Dr. Edward J. Bentz, Jr., Executive Director,
National Alcohol Fuels Commission)

INTRODUCTION

On July 18, 1979 the National Alcohol Fuels Commission, created by the Surface Transportation Act of 1978, held its first meeting. At that first meeting—open to the public—an organizational framework and work plan were adopted. That work plan attempts to answer the following basic questions enumerated in the enabling legislation creating the Commission: Why study alcohol fuels? What can alcohol fuels provide the Nation—in both short and the long term? When will they be available? How much will they cost? What is their relationship with other synthetic fuels and conventional fuels? What current or new technologies hold promise for alcohol fuel development? What has been preventing or impeding their introduction into the fuel mix to other markets? What programs or policies have the Federal Government created to realize their potential commercialization? What programs or policies should the Federal Government institute to rapidly catalyze the commercialization of these fuels in the most efficient and timely manner? And finally, what is the long- and short-term potential for alcohol fuels to displace foreign crude and promote domestic economic benefit?

MEMBERSHIP

Six U.S. Senators, 6 U.S. Representatives, and 7 private citizens comprise the 19 member Commission. The Senate Members were appointed by the President pro tempore. The House Members were appointed by the Speaker of the House. The congressional delegates to the Commission were appointed from the respective committees on appropriations, agriculture, and energy. Senator Birch Bayh (Democrat of Indiana) chairs the Commission. Representative Robert A. Roe (Democrat of New Jersey) serves as Vice Chairman. The seven public members were appointed by President Carter and formally inaugurated on June 27, 1979, at a White House ceremony conducted by Vice President Mondale.

Mandate (from enabling legislation Public Law 95-599 section 170):
Section 170(2) reads:

The Commission shall make a full and complete investigation and study of the long- and short-term potential for alcohol fuels, from biomass—including but not limited to animal, crop, and wood waste, municipal and industrial waste, sewage sludge, and oceanic and ter-

restrial crops—and coal, to contribute to meeting the Nation's energy needs. It shall take into consideration the technical, economic, legal, environmental, and social factors associated with the production, manufacture, distribution, and use of such fuels. It will evaluate the costs and benefits of alternative feedstocks and their possible end uses, and analyze the feasibility and desirability of converting these resources to alcohol fuels. Based on such study it shall recommend those policies, and their attendant costs and benefits, most likely to minimize our dependence on petroleum, insure adequate energy supplies, and contribute to the economic health of the Nation.

Section 170(c) reads:

Such report shall include the Commission's findings and recommendations with respect to—

(1) The long- and short-term potential of alcohol fuels contributing to domestic energy supply;

(2) The relative costs and benefits of developing alcohol fuels from alternative feedstocks, taking into account technical, economic, legal, competitive, environmental, and social factors associated with their production, distribution, and use; their most appropriate end uses; and a recommended time frame for their introduction into the Nation's energy mix;

(3) The existing policies and programs of the Federal Government which affect the development of such alternative fuels; and

(4) New policies and programs required to develop alcohol fuels from coal and alcohol and other fuels from the biomass to meet the Nation's projected short term and long term energy needs.

STUDIES UNDERWAY

Net energy balance, study to assess one, what is the appropriate measurement technique for assessing the net energy balance of fuels; and two, using that technique for obtaining net energy balances for both conventional as well as novel fuel technologies (ethanol and methanol).

Food versus fuel, a series of studies assessing the crucial relationships and dependences of alcohol fuel production and food/feed production. Studies will include current relationships as well as projected change due to crude oil price and supply changes, alternate supply feedstocks and agricultural and energy policy variables.

Distribution requirements for alcohol fuels, assessment of physical and institutional requirements needed and barriers to the inexpensive carriage of alcohol fuels.

Underutilized distillery capacity, an assessment of short term ethanol production capacity in the United States. Includes an assessment of current idle distillery capacity as well as additional peripheral industrial buildup.

Onfarm small scale production of alcohol, a key study examining the costs of small scale production of alcohol.

Transportation end use study, an assessment of the current and projected technologies for use of alcohol fuels in the all important transportation sector.

Cellulosic waste conversion technology, a comprehensive assessment of alternate cellulosic conversion technologies including conventional cost considerations and fuel efficiency as well as time of introduction.

Methanol supply, demand, and usage, an assessment of the supply, demand, and usage of methanol from coal and biomass.

Biomass supply studies, a series of studies assessing the supply/cost for alternative feedstock for alcohol production.

Comparative assessment of ethanol and methanol conversion technologies, an assessment of conversion and production of alcohol fuel technology on the basis of conventional costs and efficiency.

PUBLIC HEARINGS HELD IN 1979

(Hearing reports available from NAFC)

First organization meeting in Washington, D.C., July 18.

Indianapolis, Ind., August 6.

Portland, Oreg., September 8.

Jonesboro, Ark., September 28.

Secacus, N.J., October 22 and 23.

Salina, Kans., November 10.

LEGISLATIVE OVERVIEW: ALCOHOL FUELS LEGISLATION IN THE 96TH CONGRESS

S. 1200 (Senator Bayh). Provides authority to the Secretary of the Treasury to simplify and reduce the regulatory burden on the production of alcohol to be used exclusively for fuel. Incorporated by the Senate into the Crude Oil Windfall Profits Tax Act.

H.R. 3919—Crude Oil Windfall Profits Tax Act. Eliminates the current 4 cent Federal excise tax exemption on gasohol, and replaces it with a production tax credit of 40 cents per gallon of alcohol that will be blended with gasoline to make gasohol. It is possible that an amendment will be offered during the Senate debate to retain the 4 cent excise tax exemption.

S. 1268 (Senator Bayh). Amends the Petroleum Marketing Practices Act to prohibit any economic reprisals by a franchisor (oil company) against a franchisee (local gas station operator) because the local operator sells or distributes gasohol.

S. 985—Consolidated Farm & Rural Development Act. The House included a provision that makes explicit that alcohol fuel production is eligible under the loan programs of the Farmers Home Administration.

H.R. 3905 (Representative Bedell). Establishes alcohol fuel program in USDA that includes: \$600 million in loan guarantees and \$200 million in direct loans for alcohol fuel production facilities (USDA must act on all applications within 90 days), USDA to use gasohol in its motor vehicles, 10 alcohol fuel production model demonstration facilities to be established, authorizes USDA to purchase feedstocks from set-aside program participants and then sell feedstocks to alcohol fuel producers who contract for feedstocks with USDA.

S. 1775 (Senator Talmadge). Establishes rural energy program in USDA that includes: \$1 billion in loan guarantees and \$250 million in direct loans for alcohol fuel production facilities, \$100 million in direct grants for biomass demonstration projects, establishes from four to eight biomass energy centers, requires State extension services to conduct 100 biomass energy workshops per year.

S. 932—Defense Production Act Amendments (the synthetic fuels bill). The Senate floor debate began on this legislation on November 5 and is expected to last most of that week. Before the Senate are two versions of this bill. The Banking Committee version includes: \$250 million over 5 years in direct grants from USDA for demonstration projects, \$4 billion over 5 years in USDA loan guarantees for alcohol fuel production facilities, established a wood and biomass energy demonstration center in each Forest Service region. The Energy Committee version includes: \$650 million in DOE loan guarantees, price guarantees and purchase agreements for alcohol fuel production, requires use of gasohol in all Federal motor vehicles if gasohol is available in reasonable quantities and at reasonable prices, authorizes CCC to sell its sugar holdings at less than regular price levels to producers of ethanol for use in motor fuel. The Senate will decide which of the versions to adopt.

SUMMARY

The NAFC seeks your cooperation and assistance in the development of its report. It feels that alcohol fuels—and the agricultural sector—can play a vital role today and tomorrow in decreasing our perilous dependence on unstable, uncertain, and highly priced foreign oil. I hope to be invited back next year, at this time, to report on these findings.

NATIONAL ALCOHOL FUELS COMMISSION

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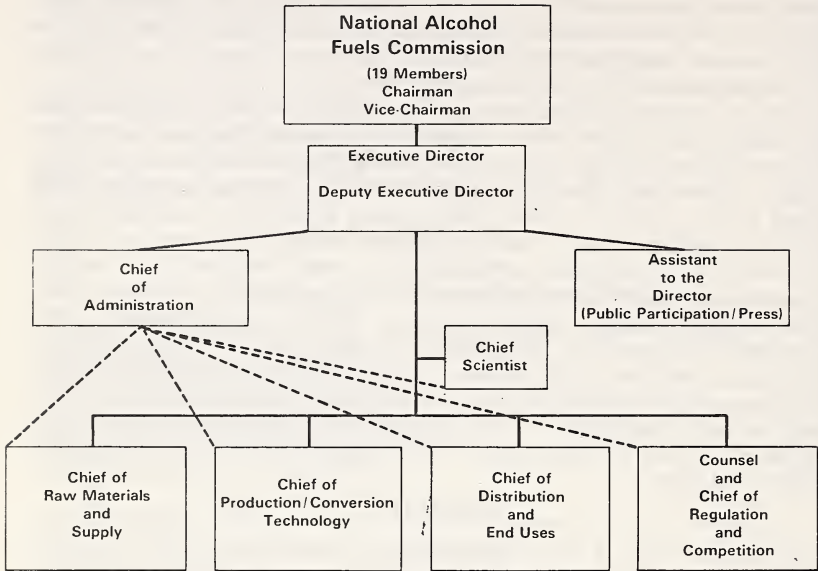
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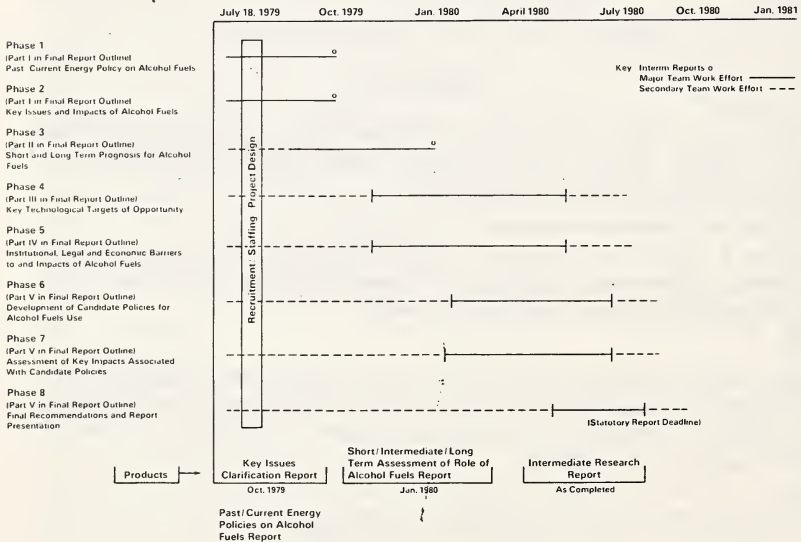
Staff

Dr. Edward J. Bentz, Jr., Executive Director.

NAFC Organization Plan



Work Schedule



ENERGY FROM THE FARM

(By Dwight L. Miller, Assistant Director, Northern Regional Research Center,
SEA/AR, U.S. Department of Agriculture, Peoria, Ill.)

The current U.S. transition period from a past of abundant, low-cost energy raw materials to a future of limited supplies, higher prices, and more reliance upon foreign suppliers has generated increased interest in agricultural farm crops and their byproducts and chemical feedstocks. Complete or major dependence on petroleum and natural gas for the foreseeable future is no longer possible, or economically feasible.

Plants, through photosynthesis, provide directly or indirectly our food, feed, and fiber, and through derivatives in fossil form, have produced reserves that supply almost all energy used by developed countries. Our dependency on the capacity of plants to convert solary energy through the basic biochemical processes that reduce carbon dioxide in the air to the building blocks of natural raw materials is, therefore, total. Our future, and that of the civilized world, may thus be dependent on better use of existing crops and modification of the plants and their environment for maximum utilization of solar energy.

The future adequacy of natural resources, based on agriculture, is controversial. Certainly food production will dominate our thinking, and many proponents insist that U.S. agriculture must be devoted entirely to the production of food. However, in the past, improvements in production, processing, and marketing, have supplied increased United State and world needs. We can optimistically say that, through research, continuing increases and more efficient production and use of biomass can be expected.

There are 200 to 300 commercial crops in the United States, of which 80 to 90 can be classed as major crops. Yet, there are at least 250,000 botanical species in the world. Chemical composition of the plant kingdom is largely unexplored. It is technically feasible to use or develop renewable raw materials for practically any fuel, chemical, and industrial use. It is primarily a question of economics. Ethyl alcohol from biomass, for example, is an excellent liquid motor fuel that is now under commercialization.

CEREALS

Cereal grains are the United States' most abundant raw materials produced by cultivation. The average composition of the most common ones are shown in table 1. They all contain starch as the principal

component. Starch can be readily converted to ethyl alcohol by fermentation, as shown in figure 1.

TABLE 1.—AVERAGE COMPOSITION OF CEREAL GRAINS¹

[In percent]

Grain	Starch	Protein	Oil	Fiber	Other constituents ²
Hard wheat.....	64	14	2	2	18
Soft wheat.....	69	10	2	2	17
Dent corn.....	72	10	2	2	11
Sorghum.....	71	13	2	2	11

¹ Moisture-free basis.² Minerals, sugars, pentosans, and vitamins.

The theoretical yield of ethyl alcohol per pound of starch is 0.568 pound. In actual commercial practice, yields generally are 90–95 percent of theoretical. Corn is the major U.S. cereal crop, and has become the basis for most current evaluation on the production of ethanol from cereal grains (starch). About 2.6 anhydrous gallons of alcohol can be produced from a bushel of corn. Representative production of cereal grain in 1978 was as follows:

U.S. production of cereal grains, 1978

	<i>Tons</i>
Corn	198,000,000
Wheat	54,000,000
Sorghum	21,000,000
Rice	6,900,000

Manufacture of ethyl alcohol from lower quality grains, surplus grains, or grain process byproducts, is the most promising source of alternate motor fuels for the next 5 to 10 years.

RESIDUES AND BYPRODUCTS

All crops produce residues; their availability and location are of major importance. With current advanced farming techniques, most residues remain in the field after harvest. Some residues must remain on the land for fertility and erosion controls. However, the total quantity is large, amounting to about 2 times the primary crop.

Representative U.S. residues and their distribution are shown in figures 2, 3, 4, and 5.

Crop byproducts and animal residues are not now used industrially to any great extent. However, most crop byproducts are highly cellulosic. Cellulose (a carbohydrate) can be converted to ethyl alcohol by fermentation, and offers future significant potential for this use as a chemical feedstock. Some of these potentials are shown in figure 6.

Anaerobic fermentation of organic materials, such as animal residues to biogas (methane, CO₂, other gases), could provide significant energy raw materials as shown in figure 7. Gas produced by this process contains 50 to 70 percent methane. The amount of biogas generated depends upon the type of residue and operating conditions. Quantities

range from 3 to 13 ft³/lb of dry matter. Generally, a ton of dry residue will yield about 10,000 ft³ of gas.

NEW CROPS

Potentially, there are unlimited new crops for energy. These are fast-growing crops such as kenaf, roselle, sorghums, and crotalaria. Chemically, these fiber crops are similar to wood, and their annual production rate is high. Kenaf yields of 10 to 25 dry tons per year have been experimentally achieved (figure 8). They may contribute significantly to future energy from the farm.

SUMMARY

The future of natural renewable raw materials from the farm as energy and chemical raw materials is excellent. There is every reason to believe that large volumes will be available if the technology is developed and the economic incentive is provided.

NEW CROP OPPORTUNITY

Of the 250,000 botanical species: From 80 to 90 produce crops in the United States worth more than \$1 million; only 200 to 300 are used for commercial crops.

Past efforts, largely agronomic and to generate new varieties. The chemical composition of plant kingdom is largely unknown.

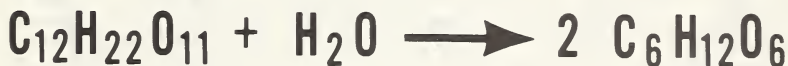
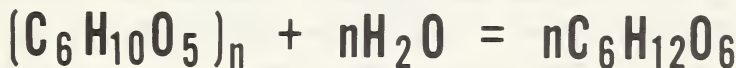
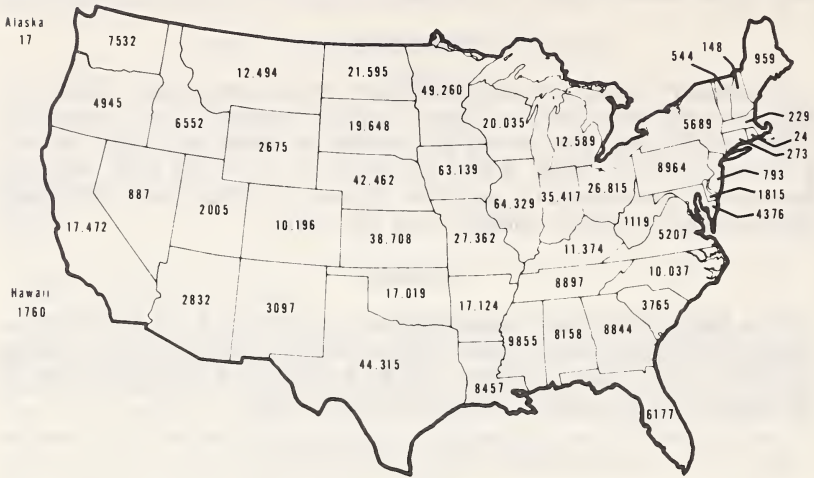


FIGURE 1

U.S. Agricultural Residues and Byproducts -- Quantities and Locations



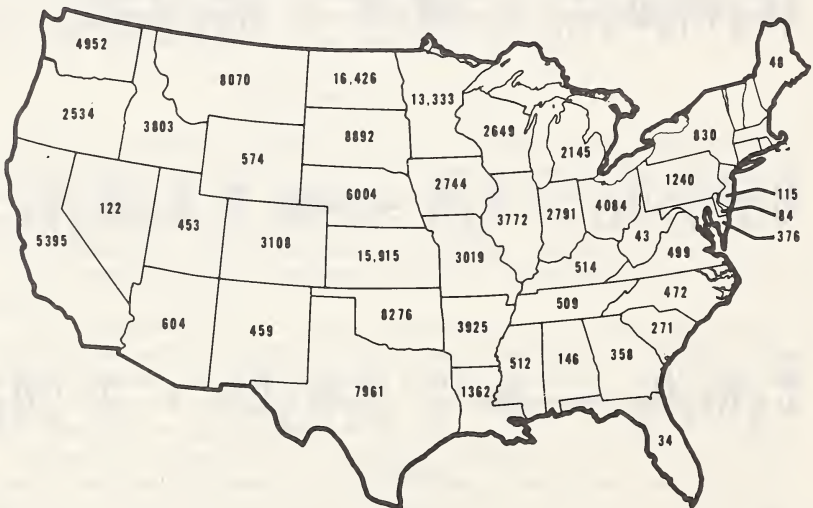
1977

Agricultural Residues
Total U.S. 677,988 × 1000 tons

U.S. Department of Agriculture

FIGURE 2

U.S. Agricultural Residues and Byproducts -- Quantities and Locations



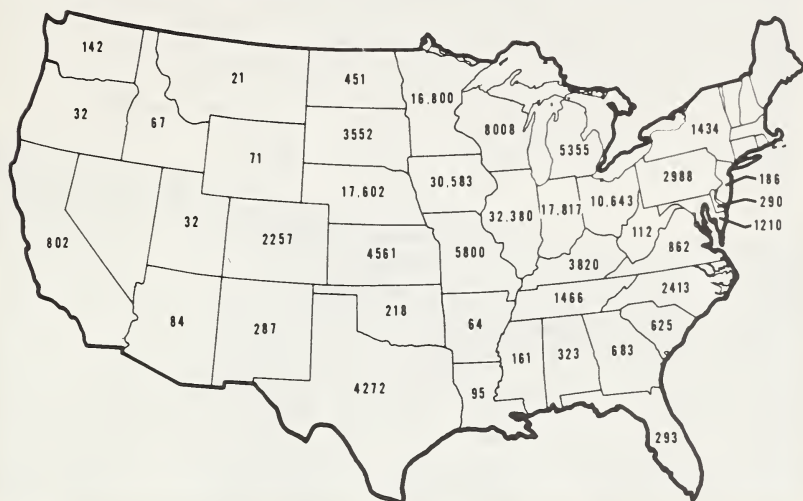
1977

Straw
(Flax, Wheat, Rye, Rice, Oats, Barley)
Total U.S. 139,424 × 1000 tons

U.S. Department of Agriculture

FIGURE 3

U.S. Agricultural Residues and Byproducts -- Quantities and Locations



Corn Stover

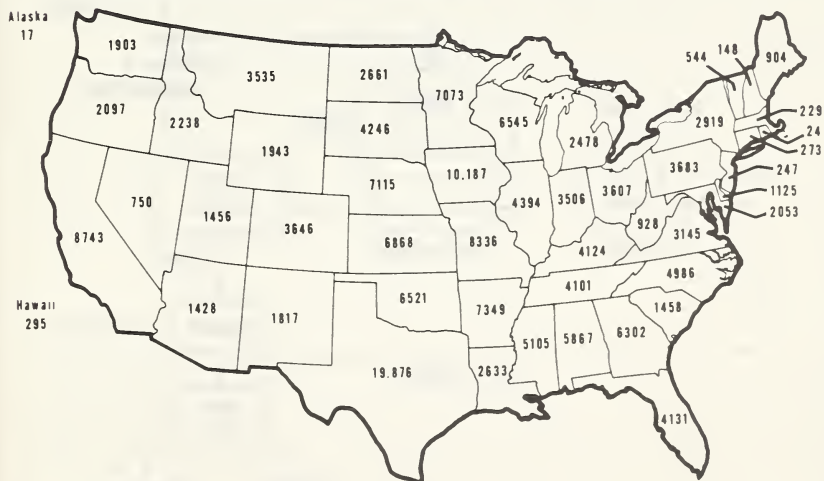
Total U.S. 178,864 × 1000 tons

1977

U S Department of Agriculture

FIGURE 4

U.S. Agricultural Residues and Byproducts -- Quantities and Locations



Animal Residues

Total U.S. 185,562 × 1000 tons

1977

U S Department of Agriculture

FIGURE 5

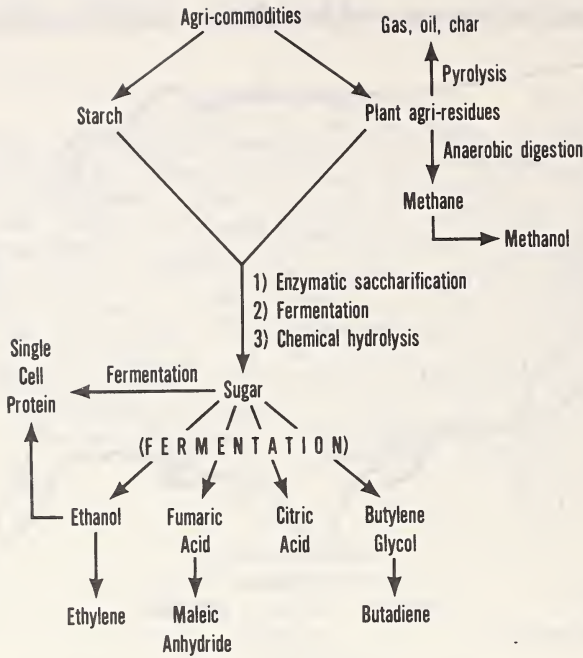


FIGURE 6

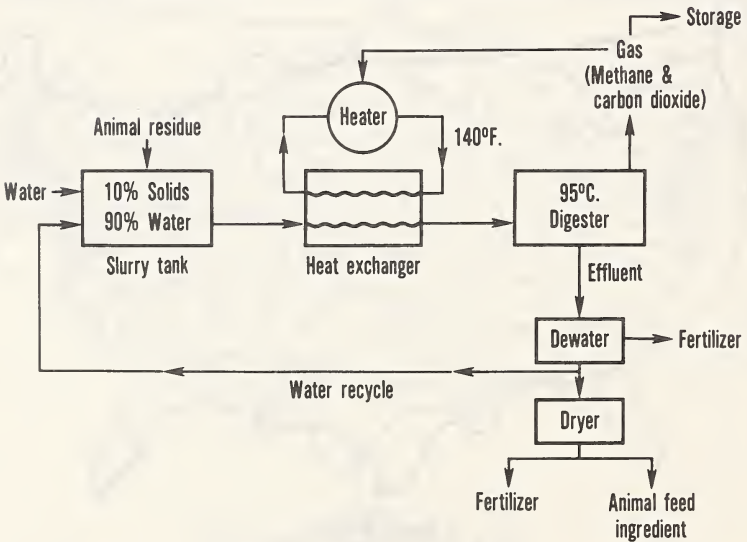


FIGURE 7



FIGURE 8

OUTLOOK FOR CHEMICAL WOOD

(By John I. Zerbe, Forest Products Laboratory, Forest Service,
U.S. Department of Agriculture)

Chemical wood covers the use of wood for charcoal, heating and synthesis gases, wood distillation products, tannins, and other chemicals. In 1978, most chemical products were obtained as byproducts from pulping. They consisted mainly of lignin derivatives and alcohol (appendix). Charcoal production, which showed a steady increase since 1970, only amounted to 750,000 tons in 1977. This was almost all in the form of briquetted recreational cooking fuel and was also produced largely from residue wood and bark. The total also included some charcoal made from lignite, coal, and agricultural residue.

With the dependence of the wood, charcoal, and chemical industries on residue wood, there was negligible drain on the forest inventory for roundwood raw material for these products in 1978. However, plants designed specifically for pyrolysis, gasification, hydrogenation, and chemical conversion were proposed and some pilot installations were built. More than 20 different gasifiers were under development and have been reviewed in "Directory of Air Biomass Gasifiers in the United States and Canada," edited by T. B. Reed and D. E. Jantzen of the Solar Energy Research Institute, 1536 Cole Boulevard, Golden, Colo. 80401. At least two pyrolysis plants were operating (one at Cordele, Ga., and one at Maryville, Tenn.), and there was one pilot hydrogenation plant (DOE wood to oil pilot plant, Albany, Oreg.).

At Coburg, Oreg., the Bohemia Lumber Co. has a plant for producing chemicals from bark. From an extraction process developed by the company, yields of about 5 to 6 percent wax was obtained. Two to three percent cork is also produced. The remainder is ground and sold as a plywood adhesive extender.

In addition to these products, ethanol is made from sulfite waste liquor at the Georgia-Pacific plant in Bellingham, Wash. According to F. W. Herrick and H. L. Hergert in "Utilization of Chemicals from Wood: Retrospect and Prospect," published in 1974, the future for marketing large volumes of concentrated spent sulfite liquor, or relatively crude fractions of this commodity, appears favorable. It was estimated that the 1973 nonfuel market of 313,000 tonnes, solids basis, would be capable of growth to 1 million tonnes by 1980, perhaps doubling again in volume by 1990. Chemical plants for making alcohol from wood were under discussion partly as a result of the National Energy Act and legislation in some States which eliminates or reduces taxes on gasoline mixed with alcohol from biomass.

In the next 5 years, we may see 100 gasification units, 50 pyrolysis plants, and 1 pilot alcohol plant with a capacity of 10 million gallons per year. It is estimated that these plants would require the following amounts of timber:

100 gasification units with average capacity of 20 million Btu per hour input—

$$100 \times 20 \times 10^6 \times \frac{16 \text{ hour}}{\text{day}} \times \frac{365 \text{ day}}{\text{year}} \times \frac{\text{ton}}{17 \times 10^6 \text{ Btu}} = 687,060 \text{ tons}$$

$$50 \text{ pyrolysis plants with } \frac{300 \text{ ton}}{\text{day}} \text{ yield—}$$

$$1.5 \times 300 \times 50 \times 365 = 8,212,500 \text{ tons}$$

10-million-gallon-per-year pilot plant for methanol (plant would require 300 dry tons of wood per day)—

$$300 \times 365 = 109,500 \text{ tons}$$

Total requirement is:

$$687,060 + 8,212,500 + 109,500 = 9,009,060 \text{ tons}$$

$$9 \times 10^6 \text{ dry tons} \approx 6 \times 10^8 \text{ cubic feet of timber}$$

In a "Mission Analysis for the Federal Fuels from Biomass Program" prepared for DOE under contract by SRI International, Menlo Park, Calif., the following detailed program inputs for missions based on wood residues are presented:

Mission	Capital cost (millions)	Product Btu per year (trillions)	Specific capital cost				Capital recovery factor (percent)		
			1975	1985	2000	2020			
Wood or low moisture to—									
Oil via catalytic liquefaction-----	\$144.9	10.1	-----	\$14.3	\$13.1	\$11.9	0.152		
Methanol gasification oxygen blown-----	268.7	10.9	-----	24.6	22.3	20.4	.152		
Ammonia gasification oxygen blown-----	267.3	9.3	-----	28.7	25.8	23.0	.152		
SNG via gasification oxygen blown-----	238.5	11.9	-----	20.0	18.1	16.2	.115		
Steam via direct combustion-----	94.1	14.6	\$6.8	6.4	6.1	5.8	.115		
Electricity via direct combustion-----	165.6	4.0	46.3	41.4	37.3	33.1	.115		
			Efficiency (percent)		Operating cost (million Btu)				
			1975	1985	2000	2020		Date	
Wood or low moisture to—									
Oil via catalytic liquefaction-----		53	55	57	-----	\$1.54	\$1.31	\$0.94	1985
Methanol gasification oxygen blown-----		58	60	62	-----	2.69	2.29	1.65	1980
Ammonia gasification oxygen blown-----		49	51	53	-----	2.22	1.89	1.60	1980
SNG via gasification oxygen blown-----		63	64	65	-----	2.12	1.75	1.43	1980
Steam via direct combustion-----	77	77	78	80	\$0.93	.81	.73	.67	1975
Electricity via direct combustion-----	20	21	23	25	5.90	5.43	4.88	4.34	1975

APPENDIX
BYPRODUCTS FROM PULPING.¹

Company, mill and major tradenames. ²	Remarks.
American Can Co., Rothschild, Wis.:	
Marasperes	Dispersants.
Marabond	Binders.
Maracons	Concrete admixture.
Maratans	Leather tanning.
Norlass	Animal feed supplement.
Kelig	Water treatment additives.
Maracell	Scale inhibitor.
Boise Cascade Corp., Salem, Oreg.	Torula yeast and lignosulfonates.
Consolidated Papers, Appleton, Wis.:—Stapel	Binder, dispersants.
Crown Zellerbach, Camas, Wash., Lebanon, Oreg.:	
Orzan A, S.	Dispersant.
Orzan AH-3, P.	Sequestering agent.
Orzan G	Emulsifier, resin extender.
Viz-Thin	Drilling and thinner.
Zeecon	Admixture for concrete.
Flambeau Paper Co., Park Falls, Wis.	Hardwood and softwood lignosulfonates.
Georgia-Pacific, Bellingham, Wash.:	
Lignosite	Binder, dispersant.
Bell Tan	Leather tanning.
Ke-Mim	Ag mineral supplement.
Lignosal Chemical, Quebec City, Quebec: Lignosal	Wide range of lignosulfonates for dispersants binders, etc.
Masonite Corp., Laurel, Miss.: Masonex	Cattle or feed, binder.
Manasha Corp., Otsego, Mich.	Hardwood NSSC liquor for binders and dispersants.
Cnario Paper Co., Thorold, Ontario: Lioxin	Vanillin and ethyl alcohol.
Charmin Paper Products	
Green Bay, Wis.	Lignosulfonates from ammonia-base sulfite liquor.
Mahoopany, Pa.	
ITT Rayonier, Inc., Hoquiam, Wash.:	
Rayflig Rayobinder	Binder, dispersant.
Raymix	Concrete admixture.
Rayvan	Oil well drilling additive.
Raychrome	Leather tanning.
Scott Paper Co., Oconto Falls, Wis., Everett, Wash.: Trex	Whole and modified lignosulfonates.
St. Regis Paper, Rhinelander, Wis.: Toranil A, B.	Lignosulfonates, torula yeast.
Westvaco Corp., North Charles, S.C.: Polyfons, Reax, Indulin	Lignins or modified lignins produced from spent kraft liquors.

¹ Excerpt from Pulp and Paper, 11, p. 82, February 1974.

² Unless otherwise noted, all tradenames refer to products produced from spent sulfite liquors.

OUTLOOK FOR DAIRY PRODUCT CONSUMPTION

(By Emerson M. Babb, Department of Agricultural Economics,
Purdue University)

I have no serious disagreement with the 1980 outlook projected by Charles Shaw. I suspect that his projections for both milk production and commercial disappearance may be on the low side. Even if production and commercial disappearance do exceed his estimates, the figures for government purchases would not be greatly affected.

DAIRY PRODUCT CONSUMPTION THROUGH 1983

Since I have little to add to what has already been said about the 1980 dairy outlook, I want to discuss dairy product consumption during a longer run period. We used very simple models to project consumption of dairy products during 1979-83. These models were estimated using 1960-78 data. Consumption was then projected on the basis of changes in (1) the consumer price for dairy products, (2) the consumer price index for all food, (3) per capita income, and (4) time (which reflects trends in consumer preferences). The term "consumption" refers to the commercial disappearance of dairy products and excludes donations from USDA stocks. We assumed that the price of all raw milk would increase about 10 percent per year, that the consumer price index for all food would increase about 10 percent per year, that retail dairy prices would increase about 9.5 percent per year and that per capita income would increase about 11 percent per year. These are rather pessimistic assumptions from the standpoint of inflation, but the price increases were assumed to be greater during the 1979-81 period than in later years.

The following annual percentage changes in consumption (disappearance) were projected for the 1979-83 period:

Fluid whole milk	-4.7
Fluid lowfat milk	+7.2
Total fluid milk	-.2
Fresh cream	+4.1
Cottage cheese	-.4
Ice cream	+7.7
Ice milk	-2.2
American Cheddar cheese	+5.7
Total natural cheese	+6.6
Butter	+5.5

These projections suggest, that while total dairy product consumption will be relatively stable over time, the change for individual products will continue to be important.

The projected decline in consumption of whole milk is almost offset by increased consumption of lowfat milk. This reflects a continuation of the shift to lowfat milk which has resulted from changing consumer preferences and price incentives. Total fluid milk consumption is projected to remain about constant.

Fresh cream represents a turn-around situation. Consumption declined during 1960-70, but has since shown gains. Further gains in cream consumption are expected, but the increases may not be as large as in recent years. On the other hand, cottage cheese consumption during 1960-78 has been erratic, but has shown overall gains. Future consumption of cottage cheese is expected to decline somewhat.

Ice cream consumption increased less than 1 percent per year during 1960-78 and has been about constant for the past several years. But, consumption is projected to increase during 1979-83 at about the same rate as during 1960-70. Consumption of ice milk, which increased during 1960-78, is expected to decline.

Cheese has been the best performer among dairy products. Consumption of American Cheddar and total natural cheese is projected to increase at about the same rate as in recent years. Increased consumption of cheese is due primarily to trends in consumer preferences. These preferences, of course, could change. Further, imitation cheese could have an adverse impact on cheese consumption. Butter consumption declined from 1960 to the early 1970's, but has since stabilized. We may see modest increases in consumption.

IMPLICATIONS

The above projections of consumption will not be completely accurate. Many factors not included in the model could alter consumption patterns. But, the general trends in consumption are probably right.

In the aggregate, dairy product consumption is expected to show modest gains during 1979-83, with increases in excess of 1 percent per year. However, surpluses are not necessarily a thing of the past; 1977 demonstrated that growth in consumption is no insurance against large surpluses. If milk production increases much more than 1 percent per year during 1979-83, from a 1978 base, purchases of dairy products under the price support program could become a burden. On the other hand, if milk production does not show modest gains from 1978, consumers will face larger price increases during 1979-83 which would in turn affect their purchases. This situation emphasizes the importance of maintaining a balance between production and consumption in the years ahead.

THE STRUCTURE OF AGRICULTURE: AN EVALUATION OF CONVENTIONAL WISDOM

(By Ronald D. Knutson, Texas Agricultural Experiment Station, Texas
Agricultural Extension Service)

The issue of the structure of agriculture, or more appropriately family farm survival, is fraught with emotion, nostalgia, wishful thinking, and politics. The role of economists in this setting is to provide facts on which policymakers might base their decisions. This is a particularly difficult role. It is all too easy for us to get swept up in the emotions of the issue and let our values influence our analyses.

During the Butz administration there appeared to be an overt effort to downplay changes that were occurring in the structure of agriculture. The one-man farm was asserted to be the most efficient farm production unit. It was contended to have advantages in terms of costs, diversification, risk-carrying ability, family labor, and management skill. Except for voices of increasing concern expressed by an Extension Service project, it was assumed and asserted the family farm would survive (Guither).

Today it is interesting to note that, while it is no longer assumed that the family farm will survive, it is still generally assumed or asserted that the family farm is the most efficient production unit (Breimyer, Miller, Mayer). It is also assumed that if the family farm does not survive, the inevitable consequence will be higher food costs and reduced public welfare (Bergland; Kyle, Sundquist, and Guither; Breimyer and Barr).

In studying the structure issue over the past 10 years, I have become increasingly concerned about the adequacy of the factual basis that underlies such conventional economic wisdom on the structure issue. All large farms are not corporate farms. Many, in fact, have the family as a base for management even though they may not fall within the USDA family farm definition. Policy alternatives are being discussed which could substantially alter trends toward larger farm size and more highly coordinated production-marketing systems. It is critically important that those responsible for making policy decisions on structure have a sound factual basis for them.

The purpose of my discussion is to evaluate the extent to which the conventional wisdom on the structure of agriculture is based on fact. Conventional wisdom is defined as customary relationships that are generally believed to be true, right, or lasting. For purposes of this discussion, four aspects of conventional wisdom widely discussed or

apparently consumed in structure literature were chosen for evaluation:

1. That large farms have no significant efficiency advantages over smaller farms;
2. That family farms are more tolerant of risk than large farms;
3. That rural communities and quality of life in rural areas will suffer from corporate ownership and contract integration; and
4. That consumers will pay higher food and fiber prices if farms become large and highly coordinated.

My comments should not be interpreted as the final answer on each of these issues. They are rather designed to raise questions and encourage more in-depth factual analyses of the issues—hopefully before decisions are made. Following the discussion of these issues, some concluding comments will be made on future structural trends, questions raised by them, and policy implications.

CONVENTIONAL WISDOM EVALUATION

1. Efficiency advantages.—Conventional wisdom holds that the family farm is the most efficient farm production unit. As a result, the proponents argue there are no cost benefits to be gained from increases in farm size beyond the family unit.

The comparative efficiency advantage of the family farm unit, apparently, has its modern roots in the USDA one-man farm study which concluded, "From the standpoint of costs per unit of production, this size farm captures most of the economies associated with size" (Bailey, p. V). More recently, Miller, after evaluating USDA cost-of-production data, concluded that there is no evidence that economies of size are a significant force in explaining the trend toward large farms (Miller, p. 9). Breimyer in a 1979 talk was even more emphatic when he stated, "Let me first bury deep one convenient rationalization; namely, that larger farms result from economy of scale. With the possible exception of some mechanized feedlots and egg cities, there is no research evidence that larger units in agriculture are more efficient in physical operation than moderate size ones" (Breimyer).

Substantial question exists whether such statements and conclusions are based on fact or wishful thinking. It is informative to note that prior to the one-man farm study, a USDA study concluded that, "Large Midwestern corn farms can obtain some economic advantages that are generally not available to family-sized corn farms in the region" (Krause and Kyle). This study found lower input, drying, storage, and marketing costs associated with Midwest corn farms of up to 5,000 acres. Miller's conclusion is likewise suspect inasmuch as: (1) It is based upon a finding of more within size-cost variation than among size-cost variation, (2) it fails to look at costs on farms with over \$150,000 in sales, and (3) it is not clear that USDA cost-of-production studies adequately consider sources of variation in costs such as machinery, variable inputs, or marketing.

A recently released study by Mayer in the Congressional Research Service is equally disturbing (Mayer). Mayer computes the ratio of costs to sales from USDA farm income statistics. His analysis purports to show that farm costs reach a low point in the \$20,000 to

\$100,000 sales range, after which costs rise. His analysis completely ignores the fact that expenses in the farm income statistics fail to impute a value for either capital, family labor, or management contributed by the smaller farms. The adoption of this technique of analysis as a basis for policy decisions would imply that we are willing to continue to exploit middle-size farms that find it necessary to accept a below-normal wage rate, return to management, and return on capital invested in agriculture!

It is interesting to note that 3 years prior to the Mayer analysis, USDA analysts Hottel and Reinsel had modified the farm income statistics to show that if a value were imputed for family labor, management, and capital, the return on equity to farms with over \$100,000 in sales would be 1.0 to 2.5 percent higher than farms with \$20,000 to \$99,999 in sales (Hottel and Reinsel).

Tweeten used the Hottel and Reinsel technique to show that large farms have no higher costs than middle-size farms (Tweeten). Le Veen used 1974 farm income statistics modified in basically the same manner to conclude that unit costs decline 17 percent for cotton and 13 percent for cash grain as farms increased in size from between \$20,000 and \$39,999 in sales to over \$100,000 in sales (Le Veen, p. 11). After analyzing the sources of these economies, Le Veen concludes, " * * * the primary advantage of large farms derives in the first place from technology * * *. These advantages are accentuated by the effects of management, resource quality, and financial organization" (Le Veen, p. 27).

A recently completed study by Richardson at Texas A. & M. draws similar conclusions. It found that the chances of survival and success in irrigated west Texas farms consistently increase over the range of farm sizes from 160 acres to 960 acres (Richardson).

The discovery of these efficiency advantages is not new. In an article reviewing agricultural policies from the 1930's to the 1970's, Quance and Tweeten conclude that, "Large farms are on the average more efficient than small farms * * *. The difference in efficiency of large farms and small farms is widening" (Quance and Tweeten p. 36). It is important to note that this discussion of economies of scale has been limited to crop agriculture. Evidence of economies of scale favoring very large farms in animal agriculture, except cattle ranching, is even greater. For example, Dietrich found that total feeding costs were 2.6 cents higher per pound of gain (10 percent) for feedlots with 1,000-head capacity than for lots with 35,000-head capacity. A 200-head feedlot was found to have costs 15 percent higher than a 35,000-head lot (Dietrich).

2. *Risk tolerance.*—It is commonly believed that smaller farms are in a better position to withstand the production, price, and income risks associated with agriculture (Raup, Miller). This perceived higher level of risk tolerance has, in part, been based on the mistaken notion that the average farm is more diversified than large farms. Paarlberg has, for example, noted that highly levered single-crop farmers rely much more heavily on price supports than diversified family farmers do (Paarlberg, p. 57). Likewise, Miller notes that large farms often depend on a single market or crop (Miller, p. 11).

Evidence exists that such a belief may not have a basis in fact. In the early 1970's despite a general trend toward greater specialization, White and Irwin failed to find a clear relationship between size and specialization (White and Irwin). More recently, the research of Pope refutes the notion that large farms are more specialized. Using four different measures of diversification, Pope concludes that farm size and diversification are positively correlated—large farms are more diversified (Pope and Prescott).

Large farms are also more likely to use available marketing and management tools to reduce risk. It is well known, for example, that large farms are more likely to be involved in contracts and the use of the futures market (Department of Commerce). As farm firms become even larger and evolve into conglomerates, the range for spreading risks through different levels of the market channel and among non-farm products increases. In many respects, the larger the farm—whether conglomerate or not—the more opportunities there are to spread or hedge against risks. Instances of large corporations pulling out of agricultural production are frequently cited as evidence that large-scale agriculture cannot compete. However, it is interesting to note that their holding are generally sold to another large corporation.

3. *Rural communities and the quality of life.*—Considerable speculation exists about the impact of large farms on rural communities, the quality of life, and the preservation of rural values. Conventional wisdom holds that communities dominated by family farmers have a higher level of economic vitality with citizens more involved in community affairs and institutions (Heffernan, 1979). Others assert the importance associated with preserving the values found in rural America (Briemeyer).

It is undoubtedly difficult to objectively evaluate such inherently value-laden conclusions. Most of us come from farms or rural communities. Our pleasant memories of farm life color our thinking to the point we have little sympathy with urban living (Vidich and Bensman).

While having a basic sympathy for the family farm and rural life, I find the literature to be less than convincing. Most of the conclusions drawn with respect to the impact of large farms on quality of life are based on a few studies by rural sociologists (Heffernan 1972; Community Service Task Force, Plock). Basic methodology used in these studies involves a comparison of a single-family farm community with a single-corporate farm community. Such studies suffer from a lack of control over variables used to measure quality of life. For example, no indication is provided of the quality of life in the corporate community before corporate involvement existed.

More basic questions exist as to whether differences in values between rural and urban areas are any longer real. Farmers are now a minority even in rural areas. Farmers, rural businessmen, and urbanites living in rural areas have demanded good roads, fire and police protection, educational quality, sewer and water treatment. This led one rural sociologist to conclude, "Rural society as we used to know it is virtually nonexistent" (McKay).

The notion that a decline in the number of farms in rural areas automatically leads to a decline in economic activity and the quality of

life in rural areas is itself suspect. The conclusion depends, in part, on the productivity of the system that replaces it and the opportunities for alternate employment created by it. Growth in an industry in one area such as High Plains cattle feeding can lead to a decline in one industry but a rise in another. Economists find it very difficult to analyze the net impact of such changes, particularly when a higher level of total economic activity results, such as in cattle feeding or broilers. It is interesting to note that while rural sociologists assert that corporate farming leads to a lower quality of community life, they have been unable to identify the same effects in vertically integrated contract farming situations such as broilers (Heffernan 1978, 1979; Plock).

4. *Food and fiber prices.*—In the end, conventional wisdom holds that the consumer will pay higher prices from large-scale agriculture. Breimyer and Barr, for example, note that, "If farming were to become so highly concentrated that production and marketing of some farm commodities would be confined to a few firms, any economies of size in production would be partly or wholly denied to the consumer" (Breimyer and Barr, p. 19). According to Rhodes and Kyle, such a denial would result from increased merchandising and marketing costs, unionization of agricultural and agribusiness workers, and the lack of effective competition (Rhodes and Kyle, p. 4).

The support for such adverse consumer impact contentions rests almost entirely on the economic theory of imperfect competition. While somewhat higher costs of merchandising and unionization may be associated with integrated agriculture, it is not at all clear that consumer benefits would be wholly denied.

In fact, evidence from broilers indicates substantial consumer cost benefits were derived from the structural changes that have occurred over the past 30 years. For example, despite inflation the nominal price of broilers was the same in 1978 as it was in 1950. The real price of broilers declined 45 percent while consumption more than doubled (table 1). Such evidence over a 30-year period can hardly be viewed as contrary to the consumer interest.

TABLE 1.—NOMINAL AND DEFLATED BROILER PRICES AND PER CAPITA CONSUMPTION, 1950-78

[Price in cents per pound]

Year	Nominal live price	Deflated ¹ live price	Consumption per capita (pounds)
1950.....	27.4	27.4	20.6
1955.....	25.2	20.8	21.3
1960.....	16.9	20.4	28.0
1965.....	15.0	14.4	33.4
1970.....	13.6	12.8	40.5
1975.....	26.3	8.6	40.6
1978.....	26.4	15.3	44.6

¹ Deflated by previous market year price of No. 2 yellow corn, Omaha, 1950=100.

Integration in the beef industry has become a focal point of public attention with large scale feedlots and the development of corporate integrated systems becoming increasingly prominent (Walter, pp. 38-49). Once again, however, it is impossible to trace any adverse consequences to consumers. While in this case the average nominal price of Choice steers has increased from \$28.88 per hundredweight in 1950

to \$52.34 in 1978, the real price has remained nearly constant when the effect of the price of feeder cattle and the price of corn are removed (table 2). This is an industry which has not gone nearly as far in the development of integrated systems. Yet large scale agriculture constitutes over 40 percent of the fed cattle marketings in the United States. In addition, the benefits of integration of production with marketing have only been tested by a few large firms. Future cost benefits could be as great as in broilers.

TABLE 2.—NOMINAL AND DEFLATED BEEF PRICES, 1950-78

(In dollars per hundredweight)

Year	Nominal Choice steers, Omaha	Choice ¹ steers net of feeder cattle cost	Net steer ² price deflated by corn price
1950.....	28.88	10.89	10.89
1955.....	22.16	9.54	7.88
1960.....	25.18	8.45	10.18
1965.....	25.12	10.90	10.48
1970.....	29.33	7.29	6.88
1975.....	41.83	24.14	7.91
1978.....	52.34	18.72	10.88

¹ Price computed using Kansas City Good/Choice feeder price assuming 600-lb feeder and 1,050-lb fed steer market weight.

² Deflated by previous market year price of No. 2 yellow corn, Omaha, 1949=100.

I find such examples of the benefits of large scale agriculture hard to rebut—particularly since the broiler industry has been in an essentially integrated state for nearly 20 years. The warnings of economists about the adverse long-term consequences of large scale integrated agriculture have not yet materialized.

IMPLICATIONS AND CONCLUDING REMARKS

The outlook for structure

Barring the enactment of severely restrictive government policy, I expect the trend toward large scale, coordinated agriculture to continue and possibly accelerate. Differences in rate of change in structure do, however, exist among agricultural products—particularly between the major crops and livestock.

Trends toward large scale coordinated animal agriculture may have already gone so far that they are not reversible on either political or economic grounds. The beef industry is most likely to evolve into a mixed system. If the IBP and Cargill variations of the previously developed integrated packer-feeder-feed supplier systems prove successful, they may become the model for the beef industry. Cattle ranching, while maintaining its basic family and part-time farmer ownership status, will likely be coordinated with cattle feeding through a system of contracts. Such contracts may be traded over electronic markets.

Modern hog production systems are importantly being developed by successful broiler integrators. Major meatpackers have to be asking themselves where they fit in such coordinated pork production systems.

The implications of such structural changes in animal agriculture for crop production are not as clear. One could speculate that increased incentives would exist for integrators to "line up" their feed supplies through forward contracts. The most important factor precipitating

a trend toward increased contracting in crop production could be a combination of integration in livestock with a relatively tight world supply-demand balance for grains. At a minimum, the combination of larger scale livestock production systems and more variable crop prices will likely lead to increased hedging of grain, cotton, and livestock prices as a means of reducing risk. In addition, ever-increasing land prices combined with nonfarm tax-motivated investment in agriculture will likely continue to raise questions about the development of a separate landholding class.

Policies

While an ever-increasing number of policy alternatives are being discussed, all appear to fit in one of three categories:

1. *Cost-increasing policies.*—Increasingly suggestions are being made that policies be implemented which would effectively raise the cost of larger production units (Miller, p. 10). Le Veen, for example, states, "If there is to be an end or a reversal to the trends documented * * * it will come when the basic logic of labor saving ceases to operate" (Le Veen, p. 29). Examples of the policy alternatives for accomplishing this include a progressive property tax, taxing large scale farm equipment, making employers responsible for training technology displaced workers, restricting public research and extension to helping small farmers, directing lower interest Government credit to smaller farmers, reducing or eliminating the ability to write off farm losses against nonfarm income, and pursuing a stricter policy of antitrust enforcement against agricultural firms than has been employed in the nonfarm sector.

Such policy initiatives should be evaluated very carefully before being taken seriously. Proposals to overtly raise the cost of producing food and fiber frankly scare me. The position of the United States as a world leader in efficiency of food production is no accident. It came as a result of a decision to invest in research, make it publicly available and allow the competitive system to operate. To reverse this policy runs directly counter to national public concerns including controlling inflation, increasing productivity, and increasing exports.

2. *Redistributing benefits of policy.*—A second set of policy alternatives would redistribute the benefits of farm price and income policy from large to smaller farmers. Current farm policy is equitable in the sense that all farmers are eligible for the same loan, target price, and deficiency benefits.

Congressional attempts to limit program benefits in the form of payment limitations have been largely unsuccessful (Martin). Closing loopholes in the present payment limitation program appears to be virtually an impossible task. In addition, however, to be effective payment limits would likely have to be reduced to the \$5,000 to \$10,000 per farm range to accomplish the objective of benefitting only smaller farmers.

Effective redistribution of the benefits of farm policy likely requires completely severing the tie between volume of production and Government payments. An example would be a negative farm income tax. Such a policy change would represent a major step toward placing farm policy in the same class as welfare policy.

3. *Countervailing large scale integrated agriculture.*—An alternative that is more compatible with traditional U.S. policy initiatives and the free enterprise system involves giving farmers the coordination tools by which they have a chance to compete and survive. The extension of form G loan authority to grain cooperatives was an important step in this direction. More recent support for electronic marketing concepts holds the potential for maintaining open spot and contract markets. Intensified efforts will be needed to provide smaller noncommercial and part time farmers access to commercial markets.

Having said this, it is not at all clear that the majority of farmers are willing to accept the degree of coordination and investment required to build a cooperative system that can compete in tomorrow's agriculture. The important point is that farmers be given the opportunity to make the choice.

Dangers, however, exist in this alternative, too. Cooperatives can, with patronage voting, permanent capital plans, joint ventures, and corporate membership, become the captive of large farmers. Our legal institutions including the USDA have an important role to play in protecting against such developments.

In the end, the choice between small and large farmers involves one of tradeoffs. The choice is between the efficiency of large scale coordinated agriculture and the costs associated with the potential development of monopoly structures and any adverse impacts on the quality of life. Our job is to make sure we assemble for policymakers an accurate set of facts on which they can base their decisions in this important policy area.

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STRUCTURE OF U.S. AGRICULTURE

(By Vernie R. Glasson, Director, National Affairs Division, American Farm Bureau Federation)

It should be noted at the outset of my remarks that I am not presenting a comprehensive statement for the American Farm Bureau Federation on the structure of U.S. agriculture. As has been true during the 60 years of the existence of Farm Bureau, policy for 1979, as adopted by the voting delegates of the member State Farm Bureaus, is a compilation of statements on issues that affect the "Structure of Agriculture." Those policies (which currently are under intense review in the Farm Bureau Policy Development Process) fill 90 pages of a policy booklet and cover a wide range of issues such as monetary policy, energy, farm policy, agricultural drugs and chemicals, income taxes, land use planning and daylight saving time—to mention just a few of the some 200 topics on which farmers and ranchers have expressed themselves.

In addition to the fact that Farm Bureau has no concise or simple statement that could possibly be presented on such a broad subject in my time frame today, Farm Bureau leaders and members will be actively participating in Secretary Bergland's dialog which begins at the end of this month. The "structure" question is one to which State Farm Bureaus have given special attention in recent days, and I would expect that, upon completion of the policy development process in January 1980, Farm Bureau will have a comprehensive and official statement to offer to the Secretary.

Therefore, I would like to spend my 10 minutes reviewing present Farm Bureau attitudes toward three matters under consideration: (1) land ownership and control; (2) entry into agriculture; and (3) Government farm policy. Then I would like to recommend two items for serious review during the structure dialog and conclude with a brief response to Dr. Penn's overview.

First, in response to the controversy that centers around the "big versus little" issue of farm size, land ownership and land use, Farm Bureau policy has been and remains specific and emphatic. Examples of that appear throughout the policy; taking for example:

Property rights are among the human rights essential to the preservation of individual freedom.

We believe in the American capitalistic private competitive enterprise system in which property is privately owned, privately managed and operated for profit and individual satisfaction.

We oppose any governmental action that infringes on an individual's right to own and manage private property. Any erosion of that right weakens all other rights guaranteed to individuals by the Constitution.

In short, the Farm Bureau is adamant in support of right to own, hold, and operate private property. We view any attempt to restrict size of operation or land ownership as a direct attack on individual liberty.

Farming is not a way of life. It is a means of livelihood for many Americans, and the well-being of all farm and ranch families depends on the opportunity to make a profit and to earn and get higher incomes. Their opportunity to improve their standard of living may depend on their ability to increase the size of their farm businesses. They must not be denied this opportunity.

As to problems of entry into agriculture for beginning farmers and unfair competition, Farm Bureau has many concerns regarding monopoly power, regarding the entry of huge amounts of outside capital from nonagricultural firms into agriculture, and regarding foreign investment in U.S. farmland. We support effective antitrust programs to prevent monopoly power in agriculture as well as other sectors of the economy. We support changes in the tax code to eliminate any unfair advantages of nonagricultural firms, such as writing off tax losses on agricultural operations against nonagricultural income. We support changes in any tax laws that provide foreigners preferential tax treatment.

Relative to farm policy and its impact on structure, Farm Bureau favors a market-oriented agriculture. We seek an economic climate in which farmers can produce and market without the threat of Government-controlled surpluses being used to manipulate markets. Our 1979 policy indicates that the basic provisions of the Food and Agriculture Act of 1977, if properly administered, constitute a suitable approach to achieving this goal.

Based on current Farm Bureau concerns, I believe that there are two major elements which should be considered seriously in any review of the structure of agriculture. I hope these two issues will become an active part of the Secretary's dialog, as they relate directly to the cost-price problems which farmers face.

First is inflation's impact on the modern American family farm, regardless of size, location, or crops produced. Many of the issues under consideration—entry into agriculture, tax policy, price support questions—are relevant largely because of the choking increases in cost of doing business—and in every day living of farm families—brought about primarily because of deficit Federal spending and the tremendous volume of Government regulation. Farm Bureau members think that as Secretary Bergland seeks to find the real culprit in the modern farm problem, he will find that inflation is the root cause of our difficulties.

Second is the need to improve the marketing ability of farmers. What are the possibilities for bargaining associations for various commodities that have not utilized such an approach. What are the problems with this approach? Farmers have said for years that they need to be better marketers. What legislative changes are necessary to help them achieve this end? Can such changes improve the farmer's bargaining power? Farm Bureau thinks that enactment of marketing and bargaining legislation would help.

Now to comment on Dr. Penn's overview: J. B. makes it very clear why society should be concerned about the structure of agriculture. As he says, society does not really care at all about "structure," but rather the performance of that structure.

Five points were made:

The quantity, quality, and price of food available for domestic and foreign customers. How does U.S. agriculture rate compared to other countries? How much food does the U.S. import? What about quality? We are told it is the best in the world. Price? Seventeen percent of the American people's disposable income is spent on food. The percentage is significantly higher in other nations. Food is a bargain in America.

Efficiency of resource use and contribution to national economic growth. How does U.S. farm structure rate? Is our productivity better than that of other countries? Could we make more efficient use of land resources? How efficiently can apples be produced on the Great Plains, as compared to wheat? Farm structure presently provides, as I have mentioned, bargains to American consumers and still produces enough for export to be a very significant factor in our balance of payments. Our productivity is unmatched by any other major nation.

Care and preservation of the environment. Name a group in society that has had better performance in this area than farmers as a whole, and I'll show you someone who fooled Mother Nature.

Relationship to rural communities. Structure has had a major role in impacting some rural communities. The changes that have occurred, however, cannot be blamed entirely on farm structure as the industrial revolution, farm technology and mechanization, transportation, and social policy have all been a part of this impact.

The fifth point, flexibility and adaptability. What about farmers' response in placing some 60 million acres back into production in 1973 after years of land retirement? Consider the shifts of former corn acreage to soybean production in the midwest; cotton to soybeans and rice in the south; grassland turned into wheat production and back to grassland to produce beef. There is great significant flexibility in the present structure.

So, in response to the point of society caring about performance, rather than structure per se, it is my hope that all who see fit to make their feelings a part of the record, will consider the performance of the modern farm structure. That performance is unmatched anywhere else in the world. I am reminded of the statement "If it ain't broke, don't fix it!"

COMMODITY OUTLOOK

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FOOD GRAINS OUTLOOK []

(By Paul J. Meyers, Grains Analyst, World Food and Agricultural Outlook and Situation Board)

This year's world [wheat and rice] situation is highlighted by reduced production, record or near record trade levels, slight increases in utilization, and reduction in stocks. These conditions have led to much higher prices than those of a year ago.

WORLD WHEAT OUTLOOK

Smaller world crop in prospect

The world wheat crop for 1979-80 is currently forecast at 401 million tons, 9 percent below last year's record of 439 million. Production outside the United States is expected to be down 12 percent from a year ago.

The largest decline is forecast to occur in the Soviet Union, where production is expected to be down nearly 40 million tons (31 percent) from the record 120 million of last year. Higher than normal winter kill, and hot, dry conditions during May and June, were the main reasons for the severe reduction. Also, harvesting conditions in the major spring wheat areas were less than ideal.

Production by the major foreign exporters (Canada, Australia, and Argentina) is expected to total around 41 million tons, 6 million below a year ago, but 6 million above the 1977-78 level. Canada experienced a wet, cool spring which delayed plantings, and dry weather this summer also reduced crop prospects. Production may decline 4 million tons from the 21 million of last year.

A sharp increase in acreage in Australia is partially offsetting prospects for much lower yields. The crop, which will be harvested in December and January, may total around 16 million tons, second only to the 18 million produced last year. Argentina's crop may remain near the 8.1 million tons of a year ago.

Western and Eastern European crops were down substantially from a year ago, with the severe winter causing serious crop damage. Also, dry conditions this spring reduced yields in nearly all of the Eastern European countries.

Of the major world wheat producers, only the United States, the People's Republic of China, and India will have larger crops than last year.

Increased utilization and trade likely

World wheat utilization is expected to continue its trend upward in 1979-80, and may total 420 million tons. This would be up about 1

percent from 1978-79, but would be below the average annual growth rate of 2.8 percent from 1970 to 1978. Reduced supplies, and higher wheat prices relative to other grains are tempering the increase in use, particularly for feed.

With utilization expected to exceed production by about 19 million tons, world stocks will likely be drawn down to 86 million tons. Stocks will represent about 21 percent of utilization compared to 25 percent in 1978-79 and 17 to 19 percent during the short supply period of 1972-75. Stock levels outside the United States are expected to be down about 17 million tons, accounting for the major portion of world stock reduction.

World wheat trade in 1979-80 is forecast at a record 79 million tons, up a tenth from 1978-79, and over 50 percent larger than a decade ago. U.S. exports will likely account for three-fourths of the expected increase in world trade volume this year. The U.S. share of world trade may increase to 48 percent versus 45 percent in 1978-79 and 43 percent in 1977-78. Canada, Australia, and Argentina should account for 37 percent of world trade compared to 33 percent in 1978-79, and 41 percent in 1977-78.

Australian exports are forecast to total 11 million tons in 1979-80 (July-June), sharply above the 6.7 million shipped a year ago, but about the same level as in 1977-78. Although labor problems have partially disrupted the movement of grain, shipments during July-September were double that of a year ago. Australia has ample export supplies with stocks at record levels, and prospects for a crop approaching last year's record.

Canada's wheat exports are running about 1 million tons behind last year's pace during July-September. For the July-June year, exports may total only slightly above last year's 13.5 million tons, despite large supplies. Canada has experienced problems in moving grain from producing areas to the ports in part due to lack of sufficient railcars and poor coordination on movement of wheat with other grains and oilseeds. However, a Federal Grain Transportation Coordinator has recently been appointed and other steps are being taken to increase exports.

With Argentina's 1979-80 crop expected to about match last year's, exports may total the same as the 3.6 million tons shipped in 1978-79. Eastern Europe will likely export less than last year because of reduced crop prospects. The Turkish Government has had difficulty in purchasing wheat from farmers, and exports will be below last year's level.

Virtually all of the increase in 1979-80 world wheat imports is expected to come from the Soviet Union and Eastern Europe. Soviet wheat imports are expected to reach 11 million tons, or more than double the 5 million tons of 1978-79. To date, about 8-9 million tons of wheat have been purchased by the Soviets including about 5 million tons from the United States (July-June basis). With the reduced wheat crops in Eastern Europe, imports may increase to 6 million tons, compared to 3.9 million in 1978-79. Imports by China and Pakistan will likely decline because of expected larger crops.

U.S. WHEAT OUTLOOK

Production near record

A 10-percent increase in harvested acreage and a record yield has resulted in U.S. wheat production this year of 2.11 billion bushels (57.5 million tons), up 18 percent from 1978, and the third largest ever. Winter wheat production of 1.6 billion bushels was 28 percent more than a year ago and reflected record harvests in Kansas, Oklahoma, and Texas. Nearly ideal growing conditions in these States resulted in yields nearly 10 bushels per acre higher than a year ago.

Durum and other spring wheat production is forecast at 518 million bushels, down 6 percent from last year. Although acreage was up, a wet cold spring delayed plantings, and early frost in some areas reduced yield prospects. Durum yields are down nearly a fifth from a year ago, while other spring wheat yields are expected to be 7 percent lower.

Despite carry-in stocks being down a fifth from last year, the near record production means total wheat supplies will be over 3 billion bushels for the second time in 3 years. Total wheat supplies are up about 2 percent from 1978-79.

Wheat feeding down sharply

Domestic use of wheat will likely be down about 8 percent from last year primarily because of a significant reduction in wheat feeding. Food and seed use may be up slightly from a year ago.

This year's indicated June-September wheat feeding of around 30 million bushels compares to 130 to 140 million fed during the same period for the past 2 years. The reduced feeding reflects favorable pasture and range conditions for most of the summer, higher wheat prices relative to competing grains, and larger sorghum supplies. For 1979-80, feed use is projected at 100 million bushels, about 80 million below the level of the past 2 years.

Food use of wheat was up about 2 percent from a year ago during the June-September period, and for the year is projected at 595 million bushels. This compares with 591 million in 1978-79 and 586 million in 1977-78.

With seed use forecast to be higher because of an expected increase in wheat acreage for 1980, domestic use will likely total about 790 million bushels, down 70 million from last year.

Record exports expected

The U.S. wheat export picture looks bright for the current marketing year. Reduced production prospects in many areas of the world, and logistical problems and labor disputes, which are hindering exports in competing exporting countries, have boosted the demand for U.S. wheat.

The estimated 30 percent reduction in the Soviet wheat crop has had a major impact on world trade prospects in general, and U.S. exports in particular. The United States is expected to provide a large share of the estimated 11-million-ton Soviet wheat import requirement for the current year. Through the middle of October, U.S. sales and shipments to the Soviets for the current marketing year (June-May) total 5.7 billion tons, compared with total shipments of 2.6 million tons for all of last year.

Exports sales have been up sharply from year ago levels. Through mid-October, outstanding sales were running nearly 150 million bushels (4 million tons) ahead of last year's level. Shipments were also up but only by about 25 million bushels (0.7 million ton). This partially reflects the prolonged shutdown of the Duluth-Superior port facilities. Combined purchases and shipments are higher this year for a number of countries including Poland, Yugoslavia, and Taiwan, while record food grain harvests in China have reduced their wheat purchases. To date, sales and shipments to China total slightly over 1 million tons compared to 2.5 million at this time a year ago.

The outlook for other exporters is for slightly higher exports than a year ago, but the United States will still account for virtually all of the increase in world trade this year.

For the 1979-80 marketing year, U.S. wheat exports are projected at 1.4 billion bushels, 200 million above a year ago, and substantially above the previous record of 1.22 billion set in 1973-74. Total wheat use is forecast at 2.2 billion bushels, 7 percent above a year ago.

Stocks to decline

With the strong export demand, utilization will likely exceed production for the second straight year. Carryover stocks are projected at around 850 million bushels, down 8 percent from last year. Stocks at this level represent about 39 percent of annual utilization compared with 45 percent last year, 60 percent in 1977-78 and 20 to 25 percent during the tight supply period of 1972-74.

Entering the 1979-80 marketing year there were about 390 million bushels of wheat in the farmer-owned reserve, and an additional 50 million bushels in CCC inventory. Redemptions have reduced the farmer-owned reserve to about 245 million bushels as farm prices have been above the release level since May, and storage payments have not been earned since June 30. By the end of the marketing year, farmer-owned reserve stocks may be drawn down to between 125 and 175 million bushels, even with the recent opening of the reserve to the 1978 crop remaining under loan, and all eligible 1979 crop wheat.

Prices up nearly \$1 per bushel from year ago levels

Despite near-record production, and large supplies, the strong export demand and likely drawdown in stocks has resulted in a dramatic improvement in wheat prices over the past few months. The upturn in prices began in May as farm prices moved up to \$3.20 per bushel. From June to October, farm prices averaged between \$3.70 and \$3.90 per bushel, compared to around \$2.85 per bushel during the same period last year. The higher prices during the early summer were due to deteriorating crop prospects in the Soviet Union and Europe and delayed plantings in both Canada and the United States. Strong export demand has sustained the higher prices. For the marketing year, prices are expected to average from \$3.60 to \$3.90 per bushel, up from \$2.94 in 1978-79 and \$2.33 in 1977-78.

For the first 5 months of the marketing year (June-October), prices will average well above the \$3.40 per bushel target price. Thus, no deficiency payments will be made on the 1979 wheat crop.

1980 WHEAT PROGRAM PROVISIONS

With an expected drawdown in stocks this year, and the prospects for continued strong export and domestic demand in 1980, it was de-

cided a wheat set-aside program was not necessary for the 1980 crop. This will be the first time since 1977 that a set-aside program will not be in effect.

Other features of the program include:

With no set-aside, all wheat producers will be eligible for target prices protection, loans, and the farmer-owned reserve.

The loan rate for 1980 will be \$2.50 per bushel, 15 cents above the level of the past 2 years. With the higher loan rate, the minimum release and call levels for wheat in the farmer-owned reserve will be increased to \$3.50 and \$4.38 per bushel, respectively, at the beginning of the 1980 marketing year. Current release and call levels are \$3.29 and \$4.11 per bushel. Within the next few weeks the Department will ask for public comments on proposed changes in the reserve program provisions.

The current estimate of the 1980 wheat target is \$3.07 per bushel based on preliminary estimates of costs and yields, and calculated according to the formula in the Food and Agriculture Act of 1977. The 1979 target price of \$3.40 per bushel had been increased from the formula level to compensate producers for participation in the set-aside program.

The national program acreage is 70 million acres for 1980. This represents the number of acres needed to meet projected domestic and export demand, and to provide for an adequate carryover.

Producers who plant no more wheat in 1980 than was planted, set aside, or for other reasons was considered to have been planted to wheat in 1979, will have full target price protection. Farmers who exceed this acreage will be subject to an allocation factor that can reduce any target price payment by up to 20 percent.

A special haying and grazing program will not be offered. However, the program could be implemented at a later date, if necessary.

Producers are discouraged from bringing fragile lands into production in 1980. Such acreage used for crop production in 1980 will not be added into a producer's normal crop acreage for subsequent years.

In a recent announcement, Secretary Bergland indicated that any 1978 wheat crop remaining under loan, and all eligible 1979 crop wheat could be put into the farmer-owned reserve program at any time. Currently, there are about 50 million bushels of 1978 crop under loan, and 65 million of the 1979 crop. Around 1.2 billion bushels of the 1979 crop will be eligible for the loan and reserve programs.

OUTLOOK FOR 1980 WHEAT PLANTINGS

With no acreage restrictions in 1980, and wheat prices up a third from a year ago, wheat acreage could expand substantially from the 71 million planted for the 1979 crop. There were about 7 million acres of land taken out of production in the 1979 wheat set-aside program. Most of this land will likely come back into production in 1980. Current estimates are for wheat acreage to total between 77 and 79 million acres in 1980, up about a tenth from 1979.

Winter wheat seeding is complete in the northern winter wheat areas, but has lagged in the southern areas, partly because of dry

weather. Planting in the eastern Corn Belt has been slowed by the lagging soybean harvest.

Stands in major production areas are only fair to poor because of dry weather during September and October. Kansas had a monthlong drought, but recent rains have improved crop prospects. Topsoil and subsoil moisture are short in Oklahoma. In Texas, unseasonably hot, dry conditions have reduced prospects, with many producers concerned that the wheat will not emerge until moisture is received.

WORLD RICE OUTLOOK

Lower production likely; stocks to decline

World rice production for 1979-80 is forecast at 374 million tons (rough basis), 11 million (3 percent) below last year's record, but still the second largest ever. A projected 16 million ton decline in India's crop is the major reason for the drop in world production.

India had a weak and erratic monsoon this summer, and dry weather has persisted in several key areas during September and October so that the crop may total only 65 million tons. Rice production is also expected to decline in Indonesia, where insects and dry weather have damaged crops, as well as in Burma where deficient monsoon performance has caused a shortfall from the previous year's record crop.

Growing conditions have been relatively favorable in China, Thailand, South Korea, and the United States. China's crop could be up 3 million tons from last year's record, while Thailand's production is expected to increase 700,000 tons from a year ago. U.S. rice production is forecast at a record level for 1979-80.

The final level of world production for 1979-80 will depend to a large degree on harvests during the spring and early summer of 1980 in China, Vietnam, Indonesia, and Brazil.

Utilization of rice will likely remain near earlier levels, with some reduction expected because of lower supplies in a number of countries. Utilization could exceed production by about 2 million tons, resulting in the first drawdown in world stocks since 1976-77. Stocks of 24 million tons will represent about 9.5 percent of utilization, about the same as the past 2 years but well above the 5-percent levels of 1972-74.

Although much of the adjustment in India as a result of the short crop is expected to occur in consumption, stocks will likely be drawn down to some extent. Some drawdown is also expected in Japan, Pakistan, and Indonesia. Stock rebuilding may occur in Brazil, South Korea, Taiwan, Australia, and the United States.

World trade to remain high

World rice trade for calendar year 1980 is expected to total 11.3 million tons (milled), slightly below the record level of 11.7 million forecast for calendar year 1979, but still the second highest level ever. Import requirements will likely be lower for Bangladesh, Indonesia, and South Korea. Brazil's imports during 1980 may not reach the 500,000-ton level forecast for this year, particularly if the rice crop to be harvested during February to May 1980 increases by 17 percent as currently projected.

On the other hand, there will likely be strong import demand from several Middle Eastern countries, Nigeria, the Ivory Coast, and several smaller importers.

The likelihood of record crops in the United States and Thailand suggest continued large export availabilities. From January through September of this year, Thailand's exports of 2.2 million tons were up 84 percent from the same period a year ago and reflect large shipments to Indonesia, Bangladesh, Saudi Arabia, Iraq, Vietnam, China, and several African countries. For calendar year 1980, their exports are projected to be only 100,000 tons below the 2.9 million projected for calendar year 1979.

Japan's entrance into the export market this year in an attempt to reduce its large surplus of rice has increased world export availabilities. Japan's exports have contributed to filling demand in Indonesia, South Korea, Bangladesh, and several African markets. Japan may also play an important role in the world export market in calendar year 1980, as surpluses in excess of desired carryover levels are expected to remain above 4 million tons at the outset of the 1980 rice marketing year.

U.S. exports are expected to total a record 2.6 million tons in calendar year 1980, up 200 thousand from calendar year 1979. The United States will likely account for 23 percent of world trade next year, compared to 21 percent this year and 21 to 24 percent during 1976-78.

U.S. RICE OUTLOOK

Rice acreage up; record production likely

With relatively strong rice prices at planting time, and a favorable price outlook for the coming year, producers this past spring planted 3.05 million acres of rice. This was slightly above the level of a year ago, and sharply above the 2.26 million planted in 1977. Rice acreage was up 100,000 from a year earlier in Arkansas, while California acreage increased 35,000. The largest acreage decline occurred in Louisiana, while Texas and Mississippi plantings were slightly below a year ago. Plantings of long grain rice were up 7 percent from 1978, with less acreage planted to short and medium grain varieties.

Rice production in 1979, based on conditions as of October 1, is forecast at a record 137.8 million hundredweight (6.3 million tons), up 3 percent from 1978. The increased production reflects the larger acreage and a 2-percent increase in yields. California yields are projected one-tenth above 1978, while smaller yield increases are expected for Arkansas and Louisiana. Texas yields are forecast one-tenth below last year as a result of late plantings and crop damage from tropical storm Claudette.

With carry-in stocks of 32 million hundredweight, total rice supplies for 1979-80 are expected to total a record 169 million hundredweight, up 5 percent from 1978-79.

Domestic use to increase

Domestic use for 1979-80 is forecast at 50.5 million hundredweight, up 5 percent from 1978-79. This reflects the continuing uptrend in food and brewers' use. In 1978-79, food use was up sharply from a year earlier, but the increase may have been partly related to inventory adjustment rather than to an actual change in consumer use. Food use will not likely increase as dramatically this year, but should continue to move higher.

The milling requirements needed to meet the projected 1979-80 disappearance should provide adequate supplies of brewers' rice at rea-

sonable prices. This, coupled with expected continued large beer sales, should increase brewers use in 1979-80.

Strong export demand to continue

U.S. rice exports for 1979-80 are projected at 83 million hundredweight (2.6 million tons—milled basis), 8 percent above last year's record. The record export demand reflects continuing growth in traditional markets, large sales to South Korea, and a 15- to 20-percent increase in Public Law 480 shipments.

Export shipments through mid-October were down about one-fifth from a year earlier. This reflects smaller shipments to Italy, West Germany, Iran, Saudi Arabia, Indonesia, and Nigeria. Export sales are down 15 percent from a year ago, despite a sizable sale to South Korea for October-January delivery. Sales are down substantially to Iran, the European community, Saudi Arabia, and certain African countries. The lower shipments and sales may in part be the result of buyer resistance to recent increases in world rice prices. However, with rice prices expected to ease from early season levels, export demand will likely pick up resulting in U.S. exports in 1979-80 above the level of a year ago.

Stocks to build

Total domestic and export use in 1979-80 is projected at 134 million hundredweight, 7 percent above 1978-79, but slightly below the expected 1979 production. As a result, stocks at the end of the current marketing year may increase by 4 million hundredweight to 36 million. Stocks would represent about 27 percent of utilization, slightly above the 25 percent of the last 2 years. Commodity Credit Corporation (CCC) stocks on August 1, 1980, may total about 6 million hundredweight, 2 million below a year earlier. CCC stocks are being used for export donation programs.

Rice prices much improved

Farm prices for rice during August and September were \$1.50 to \$2 per hundredweight above the 1978 levels. The August price of \$10 per hundredweight was the highest monthly price since May 1978. The strong early season prices probably reflect the relatively tight stocks situation prior to the harvest of this year's crop, and higher medium grain prices in response to sizable sales to South Korea.

Prices are expected to show some decline during the next few months as larger supplies become available to the market. For the marketing year, rice prices are projected to average from \$8.75 to \$9.75 per hundredweight, compared to \$8 in 1978-79 and \$9.49 in 1977-78.

Rice prices for the first 5 months of the marketing year (August to December) will likely be above the \$9.05 target price. Thus deficiency payments would not be made on the 1979 crop.

Program developments

The Department recently announced that 1979 crop rice under loan could be entered immediately into the farmer-owned reserve.

USDA is currently considering options for the 1980 rice program. A proposed rulemaking was in the Federal Register. Comments will be invited through December 24 on the need for a set-aside and/or land diversion payment program, as well as levels of the target price and loan rate. The program determinations will likely be announced by early January.

WORLD SUPPLY AND UTILIZATION, 1970-71 TO 1979-80

[Million metric tons]

Item	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80 ¹
Wheat:										
Beginning stocks.....	97	74	81	63	70	64	62	99	82	105
Production.....	316	349	343	372	357	350	415	383	439	401
Total supply.....	413	423	424	435	427	414	477	482	521	506
Utilization.....	339	342	361	365	363	352	378	400	415	420
Ending stocks.....	74	81	63	70	64	62	99	82	105	86
Stocks/use ratio (percent).....	21.8	23.7	17.4	19.2	17.4	17.7	26.3	20.5	25.4	20.6
World trade.....	55	52	67	63	64	67	63	73	72	79
Rice (milled):										
Beginning stocks.....	19	19	16	11	12	12	18	16	22	26
Production.....	215	219	211	227	227	243	236	251	260	252
Total supply.....	234	238	227	238	239	255	254	267	282	278
Utilization.....	215	222	216	226	227	237	238	245	256	254
Ending stocks.....	19	16	11	12	12	18	16	22	26	24
Stocks/use ratio (percent).....	8.8	7.3	5.0	5.4	5.4	7.5	6.9	9.1	10.3	9.6
World trade.....	8.1	8.1	7.8	7.9	7.3	8.6	10.6	9.4	11.7	11.3

¹ Projected.UNITED STATES WHEAT AND RICE¹

Commodity	Unit	1977-78	1978-79 estimated	1979-80	
				Projected	Probable variability ²
WHEAT					
Area:					
Planted.....	Million acre.....	75.1	66.1	71.2	
Harvested.....	do.....	66.5	56.8	62.2	
Yield per harvest acre.....	Bushel.....	30.6	31.6	34.0	
Beginning stocks.....	Million bushel.....	1,112	1,177	925	
Production.....	do.....	2,036	1,799	2,114	+25 to -25.
Imports.....	do.....	2	1	2	
Supply, total.....	do.....	3,150	2,977	3,041	+25 to -25.
Food.....	do.....	586	591	595	+5 to -5.
Seed.....	do.....	80	87	95	+5 to -5.
Feed and residual.....	do.....	183	180	100	+30 to -30.
Domestic, total.....	do.....	849	858	790	+35 to -35.
Exports.....	do.....	1,124	1,194	1,400	+100 to -100.
Use, total.....	do.....	1,973	2,052	2,190	+110 to -110.
Ending stocks.....	do.....	1,177	925	851	+110 to -110.
Average farm price ³	Dollar.....	2.33	2.94	3.60-3.90	
RICE (ROUGH)					
Area:					
Allotment.....	Million acre.....	1.80	1.80	1.80	
Planted.....	do.....	2.26	3.00	3.05	
Harvested.....	do.....	2.25	2.98	3.02	
Yield per harvest acre.....	Pound.....	4,412	4,493	4,568	
Beginning stocks.....	Million hundred- weight.....	40.5	27.4	31.6	
Production.....	do.....	99.2	133.8	137.8	+3 to -3.
Imports.....	do.....	.1	.1		
Supply, total.....	do.....	139.8	161.3	169.4	+3 to -3.
Domestic.....	do.....	37.7	48.0	50.5	+2 to -2.
Exports.....	do.....	72.8	76.9	83.0	+5 to -5.
Use, total.....	do.....	110.5	124.9	133.5	+6 to -6.
Ending stocks.....	do.....	27.4	31.6	35.9	+6 to -6.
Difference unaccounted.....	do.....	+1.9	+4.8		
Average farm price ³	Dollar.....	9.49	8.00	8.75-9.75	

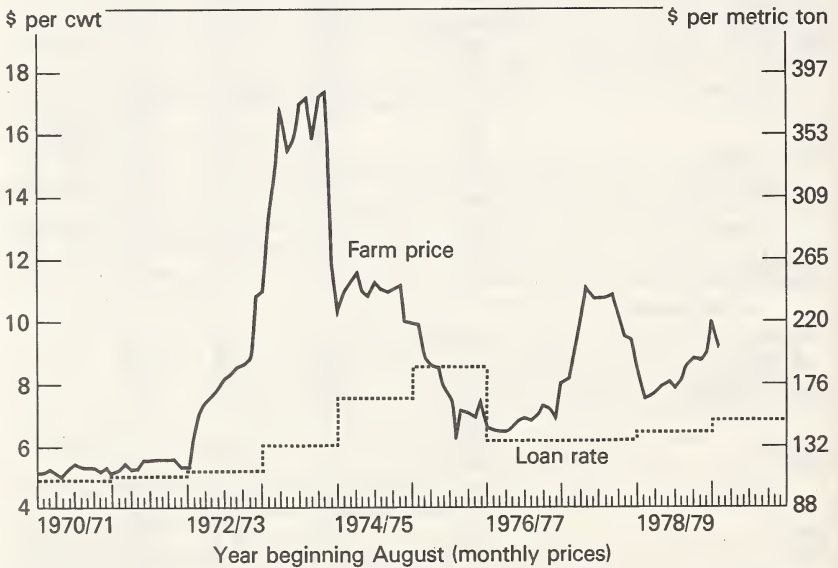
¹ Marketing year beginning June 1 for wheat and Aug. 1 for rice.² The "probable variability" reflects the "root mean square error" and/or "standard error of estimate" from trend and judgment. Chances are about 2 out of 3 that the outcome will fall within the indicated ranges.³ Season average farm price, dollars per bushel for wheat and dollars per hundredweight for rice.

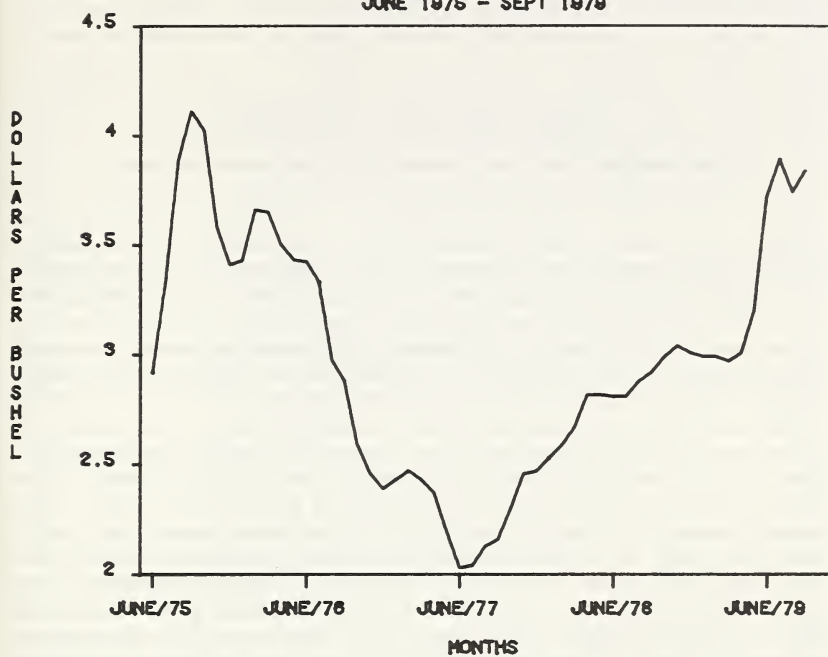
WORLD WHEAT EXPORT TRADE PATTERNS

[July/June year]

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Exporters (million metric tons):										
United States.....	19.9	16.9	31.7	31.0	28.0	31.7	26.1	31.5	32.4	38.1
Canada.....	11.5	13.7	15.6	11.7	11.2	12.1	12.9	15.9	13.5	13.8
Australia.....	9.5	8.7	5.6	5.4	8.3	7.9	8.5	11.1	6.7	11.0
Argentina.....	1.6	1.3	3.4	1.1	2.2	3.2	5.6	2.6	3.6	3.6
Subtotal.....	42.5	40.6	56.3	49.2	49.7	54.9	53.1	61.1	56.2	66.5
European community.....	3.4	4.1	6.0	5.2	6.8	8.4	4.9	5.6	8.3	7.7
Others.....	8.9	7.7	5.1	8.2	7.4	3.4	5.1	6.2	7.1	4.5
World total.....	54.8	52.4	67.4	62.6	63.9	66.7	63.1	72.9	71.6	78.7
Percentage of world trade:										
United States.....	36	32	47	50	44	48	41	43	45	48
Canada.....	21	26	23	19	18	18	20	22	19	18
Australia.....	17	17	8	9	13	12	13	15	9	14
Argentina.....	3	2	5	2	3	5	9	4	5	5
Subtotal.....	78	77	84	79	78	82	84	84	78	84
European community.....	6	8	9	8	11	13	8	8	12	10
Others.....	16	15	8	13	12	5	8	9	10	6
Percentage among major exporters:										
United States.....	47	42	56	63	56	58	49	52	58	57
Canada.....	27	34	28	24	23	22	24	26	24	21
Australia.....	22	21	10	11	17	14	16	18	12	17
Argentina.....	4	3	6	2	4	6	11	4	6	5

Rough Rice Farm Prices and Loan Rates



WHEAT: FARM PRICES
JUNE 1975 - SEPT 1979

FOOD GRAINS OUTLOOK

(By Carol Brookins, Vice President, E. F. Hutton & Company)

These are volatile and uncertain times—politically, economically, agriculturally, and atmospherically. The outlook for wheat supply and demand in the world market must be assessed within this general framework, which makes everyone's job very difficult. Besides looking at balance sheet fundamentals, market analysis must include economic and political trends and policies, exchange rates, trade policy, energy policy, foreign policy, and even public perceptions.

We have just gone through a period of near panic, which sent gold prices to nearly \$440 an ounce, up from \$315 just 6 weeks earlier; silver nearly doubled in price, peaking at around \$18 an ounce. The dollar plunged against the Mark and Swiss Franc, due to U.S. inflationary trends; and the yen continued to tumble against other major currencies, due to Japan's vulnerable energy position. During this time six OPEC producers raised prices roughly 12 percent, some above the OPEC benchmark ceiling set last June of \$23.50 per barrel; both Mexico and the United Kingdom made similar price adjustments. Demand in the U.S. housing market escalated as investors scrambled for "real assets" and the U.S. Government grew frightened that we were escalating into a period of "hyper-inflation."

During this period wheat prices, basis December futures (Chgo) from \$4.09 August 3 to \$4.79 before the Fed's October 6 anti-inflation actions sent them reeling back to \$4.02 last Friday. Markets during these critical times reflect "real" expectations about the economy and the direction of prices in the future. If a farmer's production costs rise to \$4 a bushel due to costs of energy and money, how can he continue to produce wheat for less than that? These are the types of questions that are considered by market players during those inflationary runs. So, for this short time, wheat joined other "real assets" as a target of buying demand. This was, however, a short term phenomenon. Everyone knows that there is a fixed amount, a limited amount of gold and petroleum in the world, and that wheat and other food grains are renewable resources. Given price incentives and good weather, production will increase, so that even if you put wheat in a "vault" (store it), its value could conceivably drop.

But, for the time being, current global economic problems, particularly the question of energy, are changing the way the world views resources. In wheat, for example, demand is normally recession-proof and is usually considered to increase in line with population growth. But, what about the problems of transporting grain to meet that demand in a real energy crisis? What if countries with lush harvests, due to high-yielding varieties of grain, can't afford to buy fertilizer for the crops, or if they lack fuel to run pumps to irrigate the fields? What

if countries decide to stop buying grain from the United States for political reasons, or food is withheld from people for political reasons? These potentials are very real. Look at what happened during the mini-energy crisis in the United States earlier this year—the truck strike, barge fuel shortages; look at the fact that vessels carrying grain couldn't always get bunkers in Japan during the Iranian shutdown. Think about the fact that India's Rabi crop prospects are already poor, due to a poor monsoon plus inadequate fuel to run pumps which carry ground water into fields. Shortages of power in India reportedly are already hampering efforts to move grain stocks to deficit areas. And, think about the more than 1 million metric tons of wheat the United States traditionally sells to Iran. Reports now indicate that the Khomeini government has shifted purchases to Australia this year.

Then, let's turn to the weather and the erratic patterns which have occurred in recent years. Meteorologists say we are in a period of atmospheric change. The jetstream has shifted southward bringing abundant rains and record yields to the U.S. Midwest, and leaving Canadian wheatfields without enough moisture in the past season. U.S. wheat yields were at record levels last season, but can we expect production to continue to expand at this rate? Even now demand appears to be outstripping annual production, and in the coming year India could return as an importer of grains. Having lost an estimated 15 to 20 million metric tons of their Kharif harvest due to a poor monsoon (mostly rice), observers already believe that the Rabi crop will also fall and that the Indian Government will use up their 20 million metric tons of reserve stocks this season. What happens to the Indian subcontinent if the monsoon fails again next summer? Further, what happens to India and other countries in the coming period, regarding their ability to pay for food imports as well as energy? Will the United States and other wealthy nations offer ample assistance, particularly if the world is in the throes of recession?

I raise this point regarding limits on production and on resources to buy that production. Yet, over the short term, it would appear that countries will continue to value wheat as a resource for stocking, particularly before the full impact of these problems hit them. What this means down the road is that:

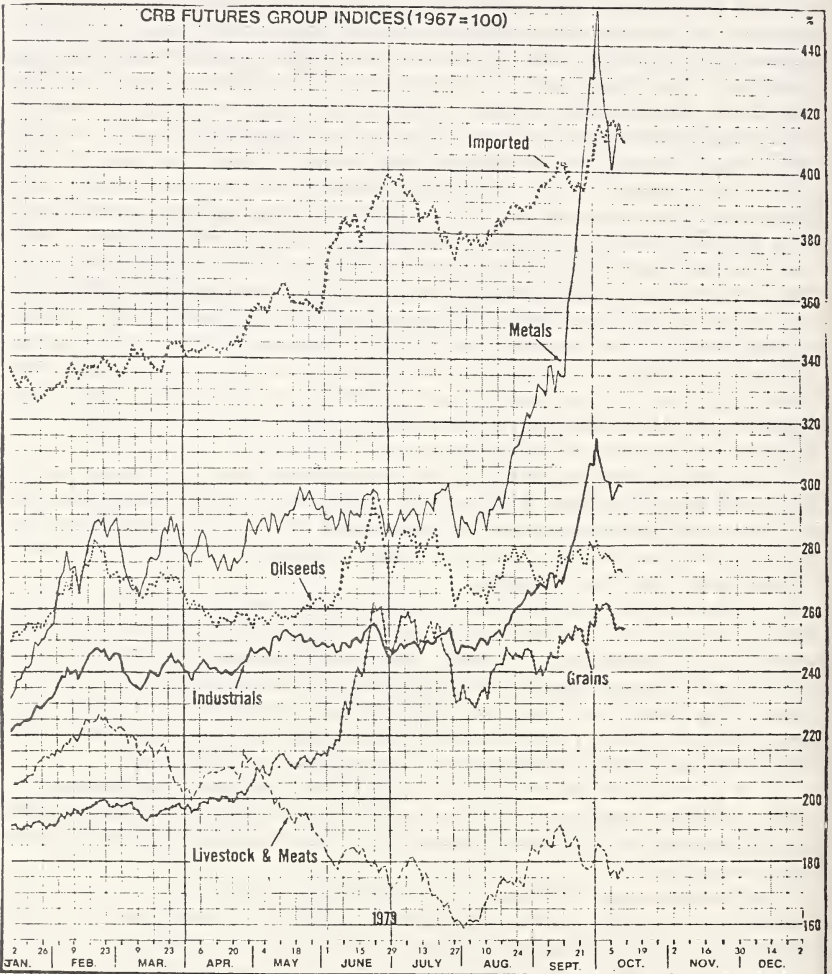
1. Wheat will continue to be a valuable commodity. Despite potential problems, the balance between supply/demand, even though uneven, will continue to tighten. In times of economic turmoil, which could lead to social unrest, food supplies should rank high with governments. In Iran, for example, during the revolution and in spite of anti-United States sentiment, U.S. wheat and rice imports were welcomed and grain imports are viewed as a priority item.

2. Wheat set-asides, on the domestic policy side, will not be likely, as policymakers continue to focus on reserve stocks to stabilize prices in times of oversupply, and to slow price rises in times of world production shortfall.

In the immediate future, the Fed's tight money policy, which has sent the prime rate to over 15 percent and the Fed funds rate to nearly 19 percent will probably continue, as the Nation's monetary officials try to change "public perceptions" or expectations about inflation. This should make the farmer-owned grain reserve very attractive to eligible producers, due to the 9 percent interest rate on crop loans. So,

although USDA official estimates suggest low participation in the program from the 1979 crops, I would think that they might be surprised by the amount of interest that could come into the program. Moreover, the farmer-owned reserve has proven to be a valuable tool to keep grain off the market. In the past, farmers' criticism has been that they have been at the mercy of the trade in anticipating market changes in demand which can improve prices, particularly from the Soviet Union. The reserve gives them that greater flexibility.

And, finally, speaking of the Soviets, one might ask whether their import demand will hold. In the framework of current political, as well as demand considerations in the coming year, the answer appears affirmative. A growing hard line in the United States against the



Soviets, caused in part by our inability up until now to deal with global changes, should create a difficult environment to sell the Soviets substantial quantities of U.S. grain in the coming year—especially if there are U.S. or world production shortfalls which raise prices substantially ahead of the November 1980 election. Because of this potential, it seems entirely probable that the Soviets will take every bushel of the 25 million metric tons of grain authorized by the United States this agreement year.

As is clear from discussion of the Soviets, agricultural fundamentals, politics, economic conditions, and public perceptions all contribute to policy formulation and ultimately to price discovery. Our task in trying to assess all these developments is monumental. If I may close, then, with some pearls of Chinese wisdom: "May you never live in interesting times."

FOOD GRAINS OUTLOOK—1980—CANADIAN PERSPECTIVE []

(By W. M. Miner, Coordinator of Grains Group, Department of Industry,
Trade, and Commerce, Government of Canada)

I was pleased to be invited to participate in your National Agricultural Outlook Conference and to provide a Canadian perspective in the food grains session. In Canada, we always admire the good work that you do in the U.S. Department of Agriculture to follow the grain situation in countries around the world and to report publicly on your findings. We endeavor to do similar work in Canada, but we cannot match your resources and your excellent output. Paul Meyers' presentation on "The World and U.S. Outlook" this morning was another example of the high caliber of the Department's work.

I intend to comment on the 1979 crop in Canada and compare our outlook projections with those given by Paul Meyers. I would also like to say a few words about our longer term program including steps underway in Canada to overcome the capacity problems that are currently limiting our export trade.

DIFFICULT GROWING CONDITIONS

In 1979, farmers in western Canada experienced most of the problems of growing grain in northern regions of the Northern Hemisphere. The winter was long and severe. Cool temperatures, snow, and wet field conditions prevented commencement of spring work until mid-May in most western areas and until early June in much of Manitoba. A wet autumn of 1978 together with normal April rains resulted in soils being saturated. Consequently, the crop was generally late. By early July, some trouble spots appeared in the prairies where subsoil moisture ratings were beginning to decline as a result of lower than normal precipitation in June. Southern Alberta regions were adversely affected and early yield estimates were lower than in 1978. Variable rainfall in Saskatchewan resulted in diverse crop conditions with crop deterioration occurring in eastern areas of the Province which carried over into the western and northwestern parts of Manitoba. By late July, the warm, dry weather was depressing Spring wheat and barley yield estimates, but increasing wheat protein content estimates.

On August 14, temperatures dropped to below freezing in a large area of eastern Saskatchewan and northwestern Manitoba, with indications of reducing both yield and quality. The frost area closely corresponded to the drought-stricken area where yields were already expected to be depressed. Conditions then improved to end-August, with above normal temperatures and dry weather over most of the prairies. Crops matured rapidly while yields continued to be forecast below average for the major grains. Reports regarding frost damage continued to worsen.

GOOD HARVEST WEATHER

Initial reports from early harvest areas confirmed above average protein predictions, plus below average yields for spring crops. Cooler weather and shower activity to almost the last week of September stalled harvesting operations, especially in northern districts of the prairies. Quality of these crops deteriorated and development of late-planted crops was retarded. Late September and early October saw excellent harvesting weather across most of the prairies. With the exception of eastern Saskatchewan and northwestern Manitoba, much of the prairie grain crop turned out to be of good quality and condition with higher protein in the Spring wheat than in either of the 2 previous years.

Across Canada, the total area seeded in 1979 to spring-planted crops reached 56.3 million acres (22.8 million hectares) slightly above the acreage in 1978. The area seeded to the major cereal grains declined from the previous year. The total wheat area in 1979 dropped marginally to 25.95 million acres (26.14) while areas sown to Durum wheat, oats, and barley all declined considerably. On the other hand, the acreage seeded to oilseeds, rapeseed, flax, and sunflowers, rose sharply by 22 percent, 76 percent, and 78 percent respectively. Both sunflower and rapeseed areas reached record levels. The corn area also increased by 14 percent to 2.2 million acres (1.9), 85 percent of which is grown in Ontario.

1979 PRODUCTION

What were the results? Total wheat production of 637 million bushels or 17.3 million tons is 18 percent below 1978 due primarily to reduced yields of 24 bushels per acre for Spring wheat, compared with 29.5 last year. Durum wheat production of 1.8 million tons is down 38 percent from the previous year as both area and yields dropped sharply. Oats production fell below 3 million tons to its lowest level in 18 years. Barley production at only 8.2 million tons is expected to be the lowest in 11 years, due to reduced acreage and lower yields. Corn production is expected to be 22 percent above 1978 levels at 4.9 million tons and is attributable to both higher area and yields in Ontario. Average Canadian corn yields in 1979 are forecast at 87.7 bushels per acre.

Total oilseed production is forecast at 6 percent above last year's record highs with yield expectations of all oilseeds, except soybeans, substantially lower than a year ago. Higher sown areas prevented a marked decline in oilseed production levels.

1979 PRODUCTION OF PRINCIPAL CROPS IN CANADA

Crop	Area (thousand acres)		Yield per acre (bushels)		Production (thousand bushels)	
	1978	1979	1978	1979	1978	1979
Winter wheat.....	735	770	40.5	42.9	29,737	33,000
Spring wheat.....	21,757	22,378	29.5	24.1	642,422	539,349
Durum wheat.....	3,650	2,800	28.7	23.2	104,800	65,000
All wheat.....	26,142	25,948	29.7	24.6	776,959	637,349
Barley for grain.....	10,533	9,100	45.3	41.3	477,083	375,408
Oats for grain.....	4,518	3,807	52.0	50.9	234,757	193,583
All rye.....	788	815	30.2	25.2	23,833	20,516
Corn for grain.....	1,933	2,200	82.0	87.7	158,482	192,980
Rapeseed.....	6,980	8,500	22.1	18.1	154,200	153,700
Flaxseed.....	1,300	2,290	17.3	13.3	22,500	30,400

GOOD QUALITY CROP

As you all know, dry growing conditions can contribute to good quality and frost creates serious problems. What is the quality of our 1979 crop? The percentage of new crop Red Spring wheat falling into the No. 1 grade at 41 percent is greater than last year's 30 percent. However, the percentage falling into the three top grades is about the same as for last year (1979—88 percent, 1978—89 percent). Preliminary indications are that the protein content of the crop at 13.3 percent is slightly higher than last year (13.0 percent). The amount of Amber Durum wheat falling into the two top grades, 68 percent, is significantly higher this year than last (43 percent). The protein content is also significantly better (13.5 as compared to 12.9 percent last year). The improved quality of the Durum crop also reflects the continued improvement in the varieties grown by producers. The protein content for Eastern White Winter wheat for 1979 is 10.6 percent, slightly down from 10.9 percent in 1978.

The proportion of the 1979 barley crop falling into Malting and 1 Feed grades is slightly higher at 88.5 percent than that of last year (75 percent). The Two-rowed barley crop is showing improved malting characteristics. The 1979 Canadian oats crop is better in quality compared to last year. The quality of the 1979 rye crop is significantly higher (71 percent for 1 hundredweight) than last year (43 percent), reflecting favorable growing conditions for the crop.

OUTLOOK FOR CANADIAN EXPORTS AND CARRYOVERS

The Canadian export target for all grains is to put 20 percent more through our system in 1979-80 than was achieved in the last season. Our export clearances totaled some 19 million tons last year, due largely to severe capacity constraints and some difficult operating conditions. I am confident we can exceed 22 million tons this season. So far, we have had a mixture of success and misfortune. On the positive side, the system is performing quite well despite capacity limitations. Car unloads at Vancouver and Thunder Bay are ahead of last season. The Churchill program remained at last year's level, although the Minister announced last week that 24,000 tons of barley are scheduled for shipment to Poland from the Port of Churchill around November 10. This is the latest date that a vessel has put into the Port of Churchill to pick up a cargo of grain. The vessel involved is the M.V. *Arctic* which is specially designed for operations in arctic waters. Unfortunately, a freighter tried to navigate under the Second Narrows Railway Bridge at Vancouver on October 9 and struck the bridge. It is expected to be back in service next January and a contingency program is in place. So far, since the accident, the car unloads are virtually unchanged from last year. In addition, some rail cars loaded with chemicals rolled into a key bridge servicing the Peace River area in Northern Alberta and the bridge was burned. Again, contingency action is being taken. The Montreal strike that began last May was settled in October and operations are returned to normal. The impact of the strike was largely on the domestic market but it has complicated efforts to put a maximum of grain through the St. Lawrence Seaway by close of navigation scheduled for December 18. Our cur-

rent estimate for wheat exports this season is 14.5 million metric tons, slightly higher than USDA projections. Barley exports should top 4 million tons and clearances of other grains should exceed last year's levels.

Regarding carryover, we are also holding ample supplies of most grains. We carried 15 million tons of wheat into this crop year and with the lower crop, our carryout should drop by at least 2.5 million tons. In the case of barley, our carryover will decline significantly, possibly by 3 million tons, due to a combination of lower production, greater domestic use and an increase in exports. The carryover of oats and rye is likely to decline somewhat but stocks of corn will increase. In the case of oilseeds, we expect our stocks to increase moderately.

ESTIMATED CARRYOVER OF PRINCIPAL CANADIAN GRAINS

[Ending stock in million metric tons]

	1977-78	1978-79	1979-80 ¹
All wheat.....	12.1	15.0	12.7
Barley.....	5.2	4.9	1.9
Oats.....	1.7	1.5	.7
Rye.....	.3	.5	.4
Corn.....	.2	.15	.5
Rapeseed.....	.4	1.0	1.2
Flaxseed.....	.5	.4	.5

¹ Preliminary forecast.

We will be developing recommended acreages and establishing initial prices for Canadian Wheat Board grains by March 1. Based on the current projections of the crop, utilization and yearend stocks, I expect the emphasis will be on moderate expansion with recommendations for more barley production. Improved wheat prices may encourage some swing toward Spring wheat and we will be trying to hold oilseed acreage close to recent levels and improve our supply position for feed grains.

THE INTERNATIONAL OUTLOOK

Canadian projections of the world situation do not differ significantly from USDA estimates and the International Wheat Council outlook. Although some downward revisions in production estimates for Eastern Europe and the U.S.S.R. may still be necessary, reports on the Southern Hemisphere crops suggest that these production estimates may need to be increased. Depending on how well the export systems perform, particularly in North America, we could reach an export level of 80 million tons of wheat this year—about 4 million tons above the latest IWC projection.

Recently, the Canadian Government raised the initial payments for western grains delivered to the Canadian Wheat Board. The current initial levels are Canadian \$4.25 for No. 1 Canadian Western Red Spring wheats, \$4.50 for No. 1 Durums, \$1.95 for No. 1 feed barley, and \$1.36 for No. 1 western oats. This, of course, reflects the higher international prices and the heavy sales commitments of the board, but also our confidence that the firm market should continue. Of course, the decline in world production and stock levels are major

factors in the strength of the market. However, we believe that the capacity constraints facing most grain trading nations, combined with a greater awareness by importers of their stock positions and more careful marketing by producers, are strong contributing factors to the firm market.

ACTIONS TO IMPROVE TRANSPORTATION AND HANDLING

Naturally, the Government and the industry are not satisfied with our volume of exports or our share of the international market. We are definitely going to improve on both. Our share has been slipping recently, largely due to limited capacity, the major difficulty being a serious shortage of rolling stock. Steps are being taken through combined actions by the producers, the Federal Government, two Western Provinces and the Canadian National Railways, to increase available grain hopper cars. Some 2,000 grain hoppers are currently entering the system, purchased by the Canadian Wheat Board with producers' money. This will be followed by 2,000 cars being leased by the Federal Government. Next, a total of 2,000 cars will be committed to service by the governments of Alberta and Saskatchewan. An additional 1,000 cars from the Canadian National Railways will come on-stream later and will be available for grain, as well as other cargo. A program to rehabilitate grain-dedicated boxcars is in place, with 2,000 in the system, a further 1,000 under repair, and 2,000 additional to be repaired and returned to service.

A second major initiative relates to the development of a new ocean grain terminal at Prince Rupert, British Columbia. A consortium of grain companies has reached an understanding with the Government to begin construction, following final site selection this December. We expect some Provincial involvement in this initiative as well. The new terminal should come into operation by the mid-1980's. In Vancouver, Canada's principal Pacific port, the companies have increased the capacity of the grain terminals about 40 percent over the last 2 years. Improvements are being made to some houses at Thunder Bay, on the Great Lakes, and to the rail and port facilities at the Port of Churchill on Hudson Bay.

The Government is proceeding with the Prairie Branch Line rehabilitation program. This involves decisions on lines to be retained in service and an upgrading program to enable the movement of modern grain hoppers with full loads. The railway companies are working on interchange agreements to facilitate movement through the system.

Given the difficulties which we have encountered with capacity and the complexity of the grain marketing system, the Government has taken two important steps to get our system moving. They appointed an emergency grain movement task force, comprised of elected Members of Parliament, to recommend initiatives that could be taken to maximize the use of our existing system. Many proposals have been put forward for the consideration of the industry. The Government also appointed a Grain Transportation Coordinator to act as a catalyst in obtaining greater use of the system and much needed improvements. Dr. Hugh Horner, formerly Deputy Premier of the Province of Al-

berta, assumed these duties on October 15. He will have a small staff of highly qualified people to work with Government agencies, the railways, the handling companies, and the private trade, to coordinate and improve the operation of the Canadian grain handling and transportation system. Despite the difficulties that we have encountered and the loss of trade that we have experienced due to capacity constraints, I detect a feeling of optimism in the Canadian industry with regard to the future.

LOOKING AHEAD—COOPERATION AND COORDINATION ESSENTIAL

Like our counterparts in the U.S. administration, we expect the world market for cereals and other grains and oilseeds to continue to expand. Overall population growth, some improvement in calorie intake in developing countries, and a growing awareness of the need to carry more grain to service the expanding demand, is certain to lead to increased levels of trade. I think that the international wheat market will exceed 85 million tons by the mid-1980's but, of course, the weather will largely determine import needs. With respect to other grains and oilseeds, it is evident that the demand for feed and products of oilseeds will also expand. Admittedly, the world economic situation is uncertain, primarily as a result of rapidly rising energy costs. This will influence, but, in my view, not change the trend toward greater production and trade.

We have established a target of moving 30 million tons of all grains to export by the mid-1980's. The actual mix of the trade will, of course, depend on production and consumption patterns. Nonetheless, we are confident that Canadian exports can increase by this magnitude and our growth will not be at the expense of other exporters.

The uncertainties of the 1970's have created a greater awareness by many nations of their mutual interdependence. This should introduce an element of stability into the world production, consumption, and trade patterns of cereal grains over the next few years. The grain policies of the major wheat exporting countries are being adjusted somewhat to the new environment and it is encouraging to be able to report that the degree of understanding and cooperation among exporting countries has grown and strengthened significantly in the last 2 to 3 years. This represents a positive development that will benefit producers in North America and other exporting countries and consumers as well. The challenge that we face is to develop a suitable environment for the expansion of production that will be necessary during the 1980's and the infrastructure that will support the level of trade that must also take place. We are currently examining these questions with the United States and other exporters. At the same time, we must be ready to adjust as grain markets shift from ample supplies to shortages. It seems to me that we have entered a new phase of grain production and trade with much to be gained by greater consultation and coordination of our programs. I can assure you that the Canadian Government is dedicated to closer working relationships amongst the exporting countries and with our customers to prepare for the demands and challenges of the 1980's.

OUTLOOK IN WHEAT PRODUCTION IN ARGENTINA

(By Diego White, vice president, National Grain Board, Argentina)

To begin with, I would like to briefly sketch out the history of wheat production in Argentina. Looking at the supply side, I will first look at the planted acreage and the unit yield.

Argentina's wheat production growth rate has been significantly lower during the past 25 years than that of its other major grains. The average planted area has been 12.5 million acres with an oscillation of (plus or minus) 20 percent around that median.

The area planted to wheat is directly related to the cattle price cycle. In other words, the wheat-cattle price relationship is the main determining factor, since wheat competes with our grazing cattle industry for the use of land during the winter months.

Diminishing marginal returns relative to other crops have concentrated wheat into its natural ecological area where no other crops compete seriously with it. That is the southwestern part of the Province of Buenos Aires. Simultaneously, the last year's figures have shown a decrease of planted acreage in the western region (south of Cordoba, northwest Buenos Aires and northeast of La Pampa) while that in the Corn Belt has increased as a result of the widespread use of the double cropping with soybeans.

It is evident to all of you that price ultimately determines production. While other countries were subsidizing the wheat farmers, Argentina Governments up to 1976 chose to subsidize the urban consumer. Their price policy included drastic measures as imposing such heavy export duties on the product so that the farmer at times only received 50 percent of international prices.

The low price of wheat which the farmer received implied a negative cost-benefit relationship between wheat and fertilizers. Therefore, the model of production he applied was low on technology.

Wheat yields over the past 25 years have increased only 36 percent which is substantially less than the increase shown by other grains in Argentina.

This fact, which is common to most wheat-producing nations, is due to the relative smaller scientific advances in wheat genetics.

In spite of this, the last 5 years have shown a continuing rate of increase in wheat yields which is explained by:

- (1) Massive use of Mexican wheats.
- (2) Increased participation in the planted area of high potential yield acres (double cropping wheat-soybeans in the Corn Belt).
- (3) Concurrent reduction in marginal production areas.
- (4) An improved input-output ratio permitting a better and greater application of technology.

The simultaneous elimination of export duties on wheat and import duties on agro-chemicals have meant an increased use of fertilizers and crop-protecting chemicals.

Fertilizers use has jumped from a negligible level to an estimated 12 percent in the current season. Owing to the above, we feel that it is reasonable to expect an increase in the Argentine crop due to higher unit yields rather than to an expansion of the area planted. That could only happen if there is a substantial change in the relative prices of cattle and/or alternate crops.

Historically, domestic demand has taken up between 50 to 70 percent of the total production. Domestic consumption, taking into account milling and seed requirements, has oscillated between 4 and 4.5 million metric tons.

Per capita consumption has maintained itself at a level of 170 kilos which is high when compared to other countries. This fact coupled with Argentina's low population increase will provide for a stable domestic consumption in the short run. Argentina's wheat exports only represents 4 percent of world trade. But, during the January-July period that share adds up to 15 percent and, if we take into account the first quarter only, it is even more significant.

This seasonal characteristic is explained by our well-known storage deficit. As new legislation, which allows for the construction of ports facilities by private enterprises comes into effect, this will change undoubtedly this situation.

Since you have borne with me up to now, I will tell you how we see the current harvest which is about to be brought in.

On the supply side we are looking forward to a 7.8-million-ton harvest (3.8 percent less than last year) which, added to a carryover of approximately 1 million tons, results in a total supply of 8.8 million tons, practically the same as last year.

We may estimate our exports at 3.6 million tons of which 2 million tons have already been committed for shipment in the first quarter of 1980. Only 1.6 million tons are left open to future contracts.

I suppose that for the complete picture of the 1980 outlook, I should also refer to the next planting season. Although it is still premature to make a precise forecast, it seems logical not to expect significant changes over the current situation. All will depend, of course, on the relative prices of products and the expected marginal return which today are the only elements defining farmers' decisions.

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FEED GRAINS: WORLD AND U.S. OUTLOOK

(By James P. Rudbeck, Foreign Agricultural Service, U.S. Department of Agriculture)

OUTLOOK IN BRIEF

The world feed grain outlook for 1979-80 is dominated by conditions in the United States and the Soviet Union which are being reflected in prices above year earlier levels. Here in the United States, we are expecting the second consecutive 7-billion-bushel-plus (180 million metric ton plus) corn crop, yet stocks are expected to decline. The Soviets, on the other hand, have the poorest coarse grain and total grain harvest in 4 years. As a result, the Soviets must turn to massive imports to sustain meat production objectives and most of these imports will have to come from the United States.

U.S. feed grain exports will likely rise about 18 percent this year, chiefly as a result of the large Soviet import demand, but also because of strong import demand worldwide and no expansion in exports by other suppliers. The capability of this country's internal transportation system to provide a steady, and ever increasing, movement of grains for domestic users and export will be increasingly important. Any major disruption will have impacts not only here at home, but also abroad.

U.S. domestic use and exports together will likely total more than this year's record feed grain harvest and prices are expected to average higher than last year. Farm prices for corn are expected to average \$2.35 to \$2.65 per bushel (\$93 to \$104 per metric ton) compared with \$2.20 (\$86.60) in 1978-79 and \$2.02 (\$79.50) in 1977-78. United States 1979-80 ending stocks are likely to decline about 4 million tons, while world stocks could be off around 15 million tons. Drawdowns in Soviet, Canadian, and Indian stocks will contribute to this decline in world stocks. In recognition of this tighter United States and world supply outlook, there will be no feed grain set-aside program in the United States in 1980.

NOTES.—The terms feed grain and coarse grains are used interchangeably in this report. For the United States, feed grains or coarse grains in this report include corn, sorghum, barley, oats, and rye. For foreign countries, these same grains are included plus millet and mixed grains.

In the United States, about 85 percent feed grain or coarse grain utilization is for livestock feeding, in foreign countries, the proportion is somewhat lower, averaging about 55-percent worldwide.

Corn production accounts for about half of worldwide coarse grain production, barley about a quarter, sorghum one-tenth, and oats, rye, millet and mixed grains, the balance.

Unless otherwise specified, split years refer to July-June years.

WORLD COARSE GRAIN SUMMARY

[Million metric tons]

	1975-76	1976-77	1977-78	Preliminary 1978-79	Forecast 1979-80
World:					
Production	645	703	704	750	730
Utilization	644	683	694	742	745
Ending stocks	57	77	86	94	79
Stocks/utilization (percent)	(8.9)	(11.3)	(12.4)	(12.7)	(10.6)
Trade	71	83	84	90	101
United States:					
Production	185	194	204	218	225
Utilization	134	131	137	153	158
Exports (October/September)	50	51	56	60	71
Ending stocks	17	30	41	46	42
Soviet Union:					
Production	66	115	93	105	82
Utilization	84	116	108	113	106
Imports	16	6	12	10	21
Exports	—	2	1	1	—
Stocks change	—3	+3	—5	+1	—3
Rest of world:					
Production	394	394	407	427	423
Utilization	426	436	449	476	481
Imports	61	77	72	80	80
Net imports	31	47	41	48	50

WORLD PRODUCTION LOWER, UTILIZATION FIRM, STOCKS TO DECLINE

Record production in the United States this year will be offset by reduced output in the Soviet Union, India, West Europe, Canada, and Australia. The latest estimate of 1979-80 world production is 730 million tons, 3 percent less than the previous year's outturn, but still higher than any other previous year. Other areas indicating increased production are China and East Europe.

The Northern Hemisphere's feed grain harvests are nearly complete, but a large degree of uncertainty still surrounds the Southern Hemisphere crops which account for about one tenth of the world total. If weather conditions continue favorable, increased production is expected in Brazil and South Africa but Argentina's coarse grain output is forecast to be unchanged.

World utilization in 1979-80 is expected to be up only slightly over 1978-79 versus an increase of 7 percent that year. Much of this slowdown is expected to occur in the United States and Western Europe. Soviet coarse grain utilization may be off, but this likely will be offset by increased feeding of wheat. In some countries of East Europe, usage could decline because of crop shortfalls. Among the developing countries—especially those with rising incomes such as South Korea, Taiwan, Venezuela, and Mexico—feed usage is still continuing to rise, but gains could be tempered by worldwide economic uncertainties and higher energy costs.

With strong demand worldwide and reduced production, world stocks are expected to fall in marked contrast to the past 3 years of continuous increases. Aggregate marketing year ending stocks are indicated to be off 16 percent, and could represent 11 percent of utilization versus 13 percent a year earlier and 9 percent during the relatively tight 1973-76 period.

World coarse grain trade is forecast to rise 12 percent to a record 101 million tons. This level of trade generally represents a sharp step-up in expected imports by the Soviet Union, as well as gains in Western Europe, Japan, and a number of developing countries.

Total shipments by the other major feed grain exporters—Argentina, South Africa, Canada, Australia, and Thailand—are not expected to expand, but to some extent will depend upon the outcome of the Southern Hemisphere crops that are just now being planted.

DESPITE RECORD PRODUCTION, U.S. STOCKS WILL TIGHTEN

Sharply higher exports and moderately increased domestic use during 1979-80 together will total more than the record 1979 U.S. feed grain production. This will reduce stocks slightly by the end of the 1979-80 marketing year. This has also led to a decision for no 1980 feed grain set-aside program. Corn prices at the farm are likely to average between \$2.35 and \$2.65 per bushel (\$93 and \$104 per ton), compared with \$2.20 (\$86.60) in 1978-79 and \$2.02 (\$79.50) in 1977-78.

The corn crop as of October 1 was forecast at 7.39 billion bushels (188 million tons) 4 percent more than the previous record last year. Total coarse grain production (corn, sorghum, oats, barley, and rye) was forecast at 225 million tons, 3 percent above last year's output. The sorghum crop was forecast to be 9 percent higher than last year, while the barley, oats and rye crops were down 19, 12, and 9 percent, respectfully.

Current estimates are for domestic use of feed grains total about 158 million tons up only 3 percent from last year, versus a 12-percent gain the year before. This slowdown in the rate of increase largely reflects fewer cattle on feed as pork and poultry output will continue at high levels, particularly during the first half of the feed year. Plentiful supplies of protein meals may also result in lower grain feeding rates.

In the cattle sector, excellent grazing conditions in most regions, higher feed prices than a year ago, and negative margins on marketed fed cattle resulted in about 25 percent fewer cattle being placed on feed this summer, compared with a year earlier. The September hogs and pigs report indicated that the inventory of market hogs was 17 percent larger than a year ago, and that the breeding inventory was 10 percent larger. Producers indicated they intended to farrow 13 percent more sows during September-November and 10 percent more sows during December-February. Broiler production will remain well-above year-earlier levels through the first quarter of 1980.

Despite prospects for record-large grain and soybean crops, higher feed prices and lower livestock and poultry prices point to a deteriorating profit position for livestock and poultry producers. These losses could force producers to reevaluate their production plans and could cause some weakening in feed demand later in the marketing year. Changes in the general economic situation might also have some impacts on consumer meat buying patterns.

U.S. feed grain exports will total around 71 million tons in 1979-80, 18 percent more than the previous record in 1978-79. Corn will account for about 90 percent of the total. Corn exports plus forward sales for 1979-80 shipment (October-September) stood at 28.2 million tons

as of mid-October, compared with 12.7 million at the same point a year ago.

Domestic feed grain use plus exports at projected levels would total around 229 million tons. This would be about 8 percent more than in 1978-79 and would be the largest disappearance of feed grains in any single marketing year. Disappearance at this level would draw U.S. feed grain stocks down by the end of the marketing year to about 42 million tons, compared with 46 million at the end of 1978-79. This would be the first reduction in carryover stocks in 5 years. Reflecting the recent expansion of eligible crops for entry into the farmer-held reserve this reserve by the end of 1979-80 is expected to stand at 13.3 million tons, or slightly less than one-third of the carryover. This past year, the farmer-held reserve was 16.4 million tons, or just over one-third of ending stocks.

1980 FEED GRAIN PROGRAM PROVISIONS

With an expected drawdown in U.S. and world stocks, and the prospects for continued strong export and domestic demand, it was decided that a feed grain set-aside program will not be necessary for 1980. This will be the first time since 1977 that a set-aside program will not be in effect.

Other features of the program include:

With no set-aside, all corn, sorghum, and barley producers will be eligible for target price protection, loans, and the farmer-owned reserve program. Oats will be eligible for the loan and reserve programs.

The loan rates will be at least \$2 per bushel for corn, \$1.90 for sorghum, \$1.63 for barley, \$1.03 for oats, and \$1.70 for rye.

The current estimates for target prices (based on the formula in the Food and Agricultural Act of 1977) are \$2.08 per bushel for corn, \$2.46 for sorghum, and \$2.35 for barley, but these are subject to revision. Preliminary target prices will be announced by March 15, 1980.

The national program acreages are: 82.1 million acres for corn, 13.9 million acres for sorghum, and 7.9 million acres for barley. This represents the number of acres needed to meet projected domestic and export demand and to provide for adequate carryover.

Producers who plant no more corn, sorghum, or barley than was planted, set-aside, or considered to have been planted to these crops in 1979, will have full target price protection. Those who exceed this acreage will be subject to the allocation factor that can cover from 80 to 100 percent of the acreage planted to corn, sorghum, or barley.

Producers are discouraged from bringing fragile lands into production in 1980. Such acreage used for crop production in 1980 will not be added into a producers' normal crop acreage for subsequent years.

It was also announced in October that farmers having 1978 and 1979 crop corn, sorghum, and oats under Commodity Credit Corporations (CCC) loan or eligible for loan may enter these grains immediately into the farmer-owned reserve. Barley will become eligible for entry when the barley reserve is no longer in call status.

SOVIET IMPORTS TO RISE

In contrast to the United States, the outlook for feed grain production in the Soviet Union depends to a large extent on domestic wheat availabilities. In recent years, depending on the relative availabilities of wheat and coarse grains, the use of wheat for feed has ranged between 25 and 40 percent of the grain used for feed in that country. This year's Soviet grain outturn was the poorest in 4 years. The estimate of total grain production of 175 million tons is 62 million tons or 26 percent less than a year earlier and well below the planned level of 227 million tons.¹ Coarse grain (mostly barley) output is down 23 million tons to an estimated 82 million tons, while wheat output, estimated at 83 million tons is 38 million below last year.

Feed utilization of grain has been increasing steadily in the U.S.S.R. as that country strives to increase the availability of meat products. This has necessitated imports even in years such as last year when production exceeded the planned level and was a record. Feed grain imports in 1978-79 were about 10 million tons, and total grains, approximately 15 million. If feeding rates are to be sustained—and available information indicates that they have been since the drought of last spring—imports will have to be increased in 1979-80.

Because of the large reliance on domestic wheat for feeding, the volume of coarse grain versus wheat imports will likely depend upon availabilities in exporting countries and price relationships between wheat and corn. Purchases to date and past experience would suggest the larger portion of imports will be coarse grain. The 1979-80 forecast is for 21 million tons of coarse grain imports versus 11 million tons of wheat. Thus, total Soviet grain imports are forecast at 32 million tons. Although the crop shortfall this year might suggest a larger volume, the Soviets have stocks to draw against and there are apparent logistical limitations for handling imported grains within the Soviet Union.

The lack of sufficient exportable feed grain supplies in other exporting countries and a preference for corn imports strongly suggests that a large portion of the Soviet's import needs, as in the past, will come from the United States. Of the 10 million tons of coarse grains imported 1978-79, 8 million tons were U.S. corn.

Under the 5-year United States-U.S.S.R. bilateral grains agreement, it was agreed in October that the Soviets could purchase up to 25 million tons of U.S. wheat and corn during the fourth year of the agreement (October 1979 to September 1980) without further consultation. Under the terms of this agreement, only a minimum of 3 million tons each of corn and wheat are specified. As of October 21, the reported sales of U.S. grains for the agreement year to the Soviet Union were just over 5 million tons of corn and 4 million of wheat. For comparison, as of the same date a year earlier, reported corn sales were about 1 million tons while wheat were slightly less than 300,000 tons.

There have been reports that the Soviets may have also purchased upward of 1 million tons of barley earlier this year from Canada and Australia, but these purchases may have exhausted exportable supplies in those two countries, given the overall export handling problems in both countries. Argentina can also be counted on to supply some corn

¹ Total grain production for the Soviet Union includes wheat, coarse grain, rice, and minor grains and pulses.

to the U.S.S.R., but probably not much more than the 1½ million tons shipped in 1978-79.

WORLD TRADE A NEW RECORD, DEMAND FIRM

There are some very tentative indications that worldwide economic conditions and higher energy costs might temper the demand for livestock products in some foreign countries and result in some slowdown in the annual rate of increase in animal feeding. However, the evidence to date is not very convincing. Current estimates indicate that aggregate usage, discounting developments in the United States and the Soviet Union, may increase slightly in 1979-80. These aggregate estimates, reflect an expected slowdown in meat production in West Europe where livestock numbers are beginning to level off, and for East Europe, where crop shortfalls might not be fully covered by imports due to logistical and financial constraints. Feed utilization, however, in several of the developing countries² is expected to continue strong. In recent years, these countries accounted for nearly 15 percent of world trade, nearly double the percentage of the early 1970's.

In West Europe, coarse grain production is off slightly from last year's record harvest and imports could advance from the 1978-79 level. Further growth in feed use of grain in the European Community is expected due largely to continued, although slower, expansion in the livestock sector and reduced supplies of competing manioc—particularly during the remaining months of 1979. Feed grain imports are also expected to be larger in Spain and Portugal.

Crop losses in East Europe were limited to the grain-deficit northern countries, while larger corn production is expected in the southern grain-surplus countries. Imports by this region could be slightly larger than in 1978-79, but so will exports. A major portion of these exports will move within the region. There are indications, however, that in Poland, the largest importer in East Europe, current import levels are already taxing port capacities. If imports are to rise further due to this year's production shortfall, grain may have to be transhipped via Western Europe at an added expense.

Japan, which accounts for nearly 20 percent of world feed grain imports, is expected to increase imports only modestly this year. In part, this is due to the expected impact of the rice disposal program. Under this program, the Government will subsidize the use of rice in animal feeds. About 100,000 tons of rice will be moved into feed channels this year, but in future years the amount could rise to 500,000 tons annually.

China, which emerged as a significant corn importer last year, is expected to remain in the market. As of October 21, about 400,000 tons of U.S. corn sales had been reported to that country versus almost 600,000 as of the same date last year. Total U.S. corn exports to China was 3 million tons during the last marketing year.

Feed usage in the developing countries of South Korea, Taiwan, Mexico, Iran, Venezuela, Malaysia, and Brazil has been increasing at an annual rate of about 10 percent. As several of these countries are not significant producers of feed grains, and in several others, the rate of increase in utilization has outstripped production, this rising feed

² South Korea, Taiwan, Mexico, Iran, Venezuela, Mexico, and Brazil.

grain utilization has translated into increasing imports. Imports by these same countries in 1979-80 are expected to approach 12 million tons, nearly 10 percent higher than during the previous year. This increase is somewhat less than those reported over the past several years and may reflect some slowdown in the recent high rates of annual gains in meat production as a result of changing economic conditions. In the case of Iran, it also reflects the recent disruptions in overall economic activity in that country, although feed grain imports are still expected to be larger than in 1978-79.

In total, world feed grain trade is forecast to increase 11 million tons in 1979-80, an increase of 12 percent. Current forecasts indicate that the total level of shipments by other exporters may not expand and could possibly decrease slightly. This implies that U.S. exports on a July-June basis could increase by more than the increase in world trade and the U.S. share of world trade could increase to 70 percent from 64 percent last year. Both Canadian and Australian exports (mostly barley) are expected to rise as large stocks will be available to supplement lower production. Both countries, however, have been experiencing internal transportation and handling problems that have limited their capabilities to expand overall grain and oilseed exports. Barley exports from Western Europe are forecast to be cut because of reduced harvests, although corn exports from some Eastern Europe countries could increase. Exports by Argentina and South Africa will hinge on the outcome of the corn and sorghum crops that are just now being planted, but based on currently available supplies and early planting indications, exports are forecast to decline in 1979-80. Brazil, a traditional corn exporter, has had to resort to imports to meet rising domestic feed demand, due to short crops over the past 2 years. If next year's harvest improves, as is now expected, some exports might be possible around mid-year 1980, but there will also be a strong tendency to replenish stocks.

LONGER TERM OUTLOOK FOR WORLD TRADE AND U.S. EXPORTS

Based on recent developments and currently indicated trends, there are probably several points that can be made about the longer term outlook for world trade and U.S. feed grain export levels:

Year-to-year changes will mostly be related to weather-induced production changes in the Soviet Union, East Europe, and West Europe.

Underlying these year-to-year changes, however, is a strong and growing demand for feed grain in these same countries, and even more importantly, in a number of developing countries, that will mostly be met by imports.

In the short term, economic conditions might temper the demand for meat products and limit feeding activity, but in the longer run, increasing population and rising income and aspirational levels will bolster demand for meat, and consequently feed grain use.

There has been virtually no growth in overall feed grain exports by other exporters and the U.S. has provided nearly all of the expansion in world trade. There is no current evidence or developments to suggest that this will change significantly in the foreseeable future.

The U.S. production plant and transportation system—despite some squeaky wheels here and there—has thus far proven responsive to both increased domestic and expanding world requirements. There is no reason to expect that it will not remain equally responsive in years ahead.

SUMMARY AND SHORT-TERM OUTLOOK

In summary, the coarse grain outlook is for utilization, trade, and prices during the current marketing year to be above a year-ago levels, while foreign production will be lower and stocks will decrease. Some of the developments over the next several months that may influence the world feed grain situation and the level of U.S. exports include:

Prospects for Southern Hemisphere crop outturns;

Further Soviet import purchase and the relationship between corn and wheat purchases;

China's imports of corn;

Operation of transportation and handling systems in major exporting and importing countries;

The general economic situation worldwide and whether this will have an impact on livestock consumption and possible effects on grain uptakes in major consuming countries;

The response of farmers in the United States to the expanded crop eligibility for entry into the farmer-held reserve program and possible further changes in the farmer-held reserve policy; and

Early indications of next season's supply and demand outlook, such as planting intentions, weather conditions, and winter crop progress in Northern Hemisphere areas, in particular the U.S.S.R. and Europe.

GRAIN CARRYOVER STOCKS, FARMER-OWNED RESERVE, CCC INVENTORY, AND PRICES

[In million metric tons]

Crop	1977/78 ¹	Estimated 1978/79	Projected 1979/80
Wheat:			
Ending stocks, total.....	32.0	25.2	23.2
Farmer-owned reserve.....	9.3	10.7	4.1
CCC inventory.....	1.3	1.4	1.4
Average farm price ²	\$86	\$108	\$132-\$143
Corn:			
Ending stocks, total.....	28.0	32.6	31.4
Farmer-owned reserve.....	8.0	13.7	11.0
CCC inventory.....	.3	2.5	2.5
Average farm price ²	\$80	\$87	\$93-\$104
Total feed grains:			
Ending stocks, total.....	41.2	45.8	42.2
Farmer-owned reserve.....	10.2	16.4	13.3
CCC inventory.....	0.6	3.7	3.7
Rice:			
Ending stocks, total.....	1.2	1.5	1.6
Farmer-owned reserve.....			
CCC inventory.....	0.5	0.4	0.3
Average farm price ²	\$209	\$176	\$193-\$215
Total grains: ³			
Ending stocks, total.....	74.5	72.7	67.1
Farmer-owned reserve.....	19.5	27.1	17.4
CCC inventory.....	2.4	5.5	5.4

¹ Farmer-owned reserves and CCC inventory are as of June 1, for wheat, Oct. 1, for feed grains, and Aug. 1, for rice.

² Dollars per metric ton.

³ Includes rye.

FEED GRAINS AND CORN ¹

Commodity	1977/78	1978/79 estimated	1979/80	
			Projected	Probable variability ²
FEED GRAINS				
Area (million acres):				
Planted	128.9	122.6	117.6	
Harvested	108.0	104.3	99.9	
Yield per harvested acre (metric tons)	1.88	2.08	2.24	
Million metric tons:				
Beginning stocks	29.9	41.2	45.8	
Production	203.4	217.3	224.1	±6
Imports	.3	.3	.3	
Supply, total	233.6	258.8	270.2	±6
Feed	117.3	133.1	136.9	±9
Food, seed, and indicated	18.8	19.7	20.0	
Domestic, total	136.1	152.8	156.9	±9
Exports	56.3	60.2	71.1	±5
Use, total	192.4	213.0	228.0	±12
Ending stocks	41.2	45.8	42.2	±8
CORN				
Area (million acres):				
Planted	83.6	79.7	80.0	
Harvested	70.9	70.0	69.5	
Yield per harvested acre (bushels)	90.7	101.2	106.4	
Million bushels:				
Beginning stocks	884	1,104	1,285	
Production	6,425	7,082	7,390	±260
Imports	3	1	1	
Supply, total	7,312	8,187	8,676	±260
Feed	3,709	4,187	4,350	±300
Food, seed, and indicated	551	575	590	
Domestic, total	4,260	4,762	4,940	±300
Exports	1,948	2,140	2,500	±150
Use, total	6,208	6,902	7,440	±400
Ending stocks	1,104	1,285	1,236	±200
Average farm price ³	\$2.02	\$2.20	\$2.35-2.65	

¹ Marketing year beginning Oct. 1 for corn and sorghum; June 1 for barley and oats.

² The "probable variability" reflects the "root mean square error" and/or "standard error of estimate" from trend and judgment. Chances are about 2 out of 3 that the outcome will fall within the indicated ranges.

³ Season average farm price, dollars per bushel.

SORGHUM, BARLEY AND OATS¹

Commodity	1977/78	1978/79 estimated	1979/80	
			Projected	Probable variability ²
SORGHUM				
Yield per harvested acre (bushels).....	56.3	55.1	63.0	-----
Million bushels:				
Beginning stocks.....	91	191	159	-----
Production.....	793	748	817	±40
Imports: Supply, total.....	884	939	976	±40
Feed.....	473	573	560	±30
Food, seed, and indicated.....	7	7	7	-----
Domestic, total.....	480	580	567	±30
Exports.....	213	200	250	±30
Use, total.....	693	780	817	±45
Ending stocks.....	191	159	159	±45
Average farm price ³	\$1.82	\$2.00	\$2.20-2.45	-----
BARLEY				
Yield per harvested acre (bushels).....	43.9	48.4	48.9	-----
Million bushels:				
Beginning stocks.....	126	172	227	-----
Production.....	420	447	364	-----
Imports.....	9	10	10	-----
Supply, total.....	555	629	601	-----
Feed.....	168	206	205	±25
Food, seed, and individual.....	158	170	170	-----
Domestic, total.....	326	376	375	±25
Exports.....	57	26	50	±20
Use, total.....	383	402	425	±40
Ending stocks.....	172	227	176	±30
Average farm price ³	\$1.78	\$1.90	\$2.20-2.40	-----
OATS				
Yield per harvested acre (bushels).....	55.8	52.2	53.1	-----
Million bushels:				
Beginning stocks.....	165	311	289	-----
Production.....	751	601	531	-----
Imports.....	2	1	1	-----
Supply, total.....	918	913	821	-----
Feed.....	512	533	530	±50
Food, seed, and individual.....	84	78	80	-----
Domestic, total.....	596	611	610	±50
Exports.....	11	13	10	±2
Use, total.....	607	624	620	±50
Ending stocks.....	311	289	201	±35
Average farm price ²	\$1.10	\$1.18	\$1.25-1.45	-----

¹ Marketing year beginning Oct. 1 for sorghum, June 1 for barley and oats.² The "probable variability" reflects the "root mean square error" and/or "standard error of estimate" from trend and judgment. Chances are about 2 out of 3 that the outcome will fall within the indicated ranges.³ Season average farm price, dollars per bushel.

Chart 1
World Coarse Grains: Production,
Utilization, Imports, and Ending
Stocks (1960/61 - 79/80)

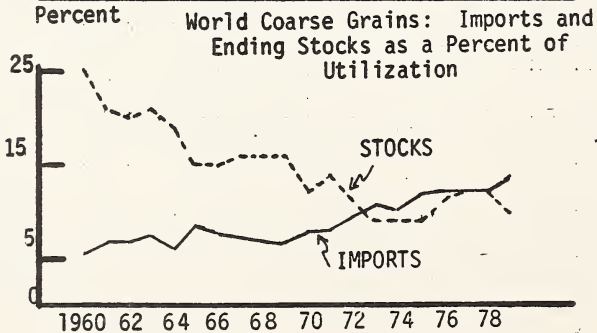
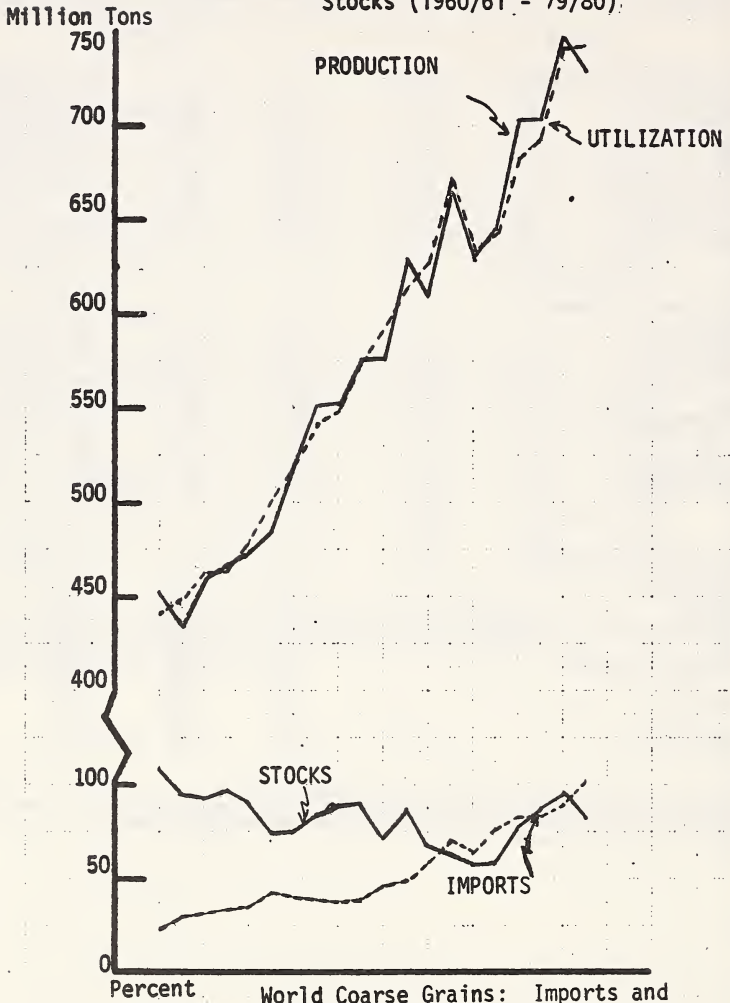
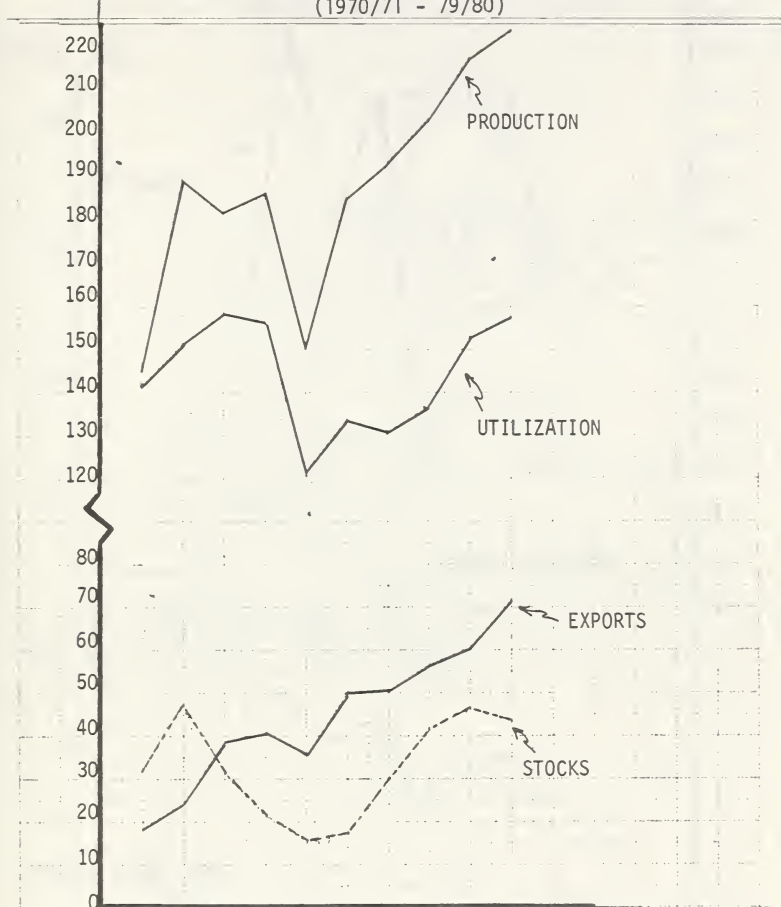


CHART 2
U.S. COARSE GRAINS: PRODUCTION, UTILIZATION,
EXPORTS AND ENDING STOCKS
(1970/71 - 79/80)



U.S. COARSE GRAIN EXPORTS AND ENDING STOCKS
AS A PERCENT OF WORLD TRADE AND ENDING STOCKS

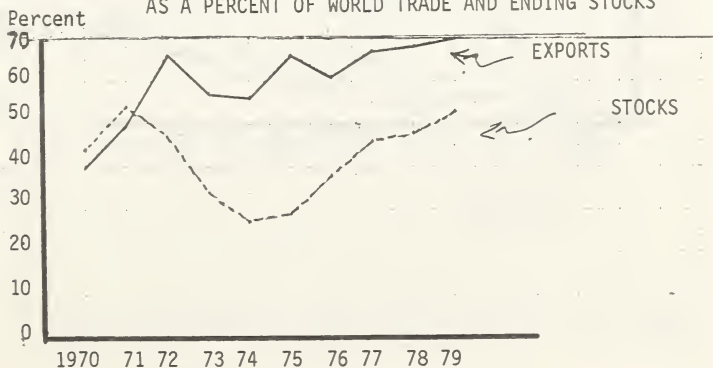


CHART 3

USSR: TOTAL GRAINS PRODUCTION, UTILIZATION, FEED
USE AND IMPORTS; COARSE GRAINS FEED USE AND IMPORTS
(1970/71 - 79/80)

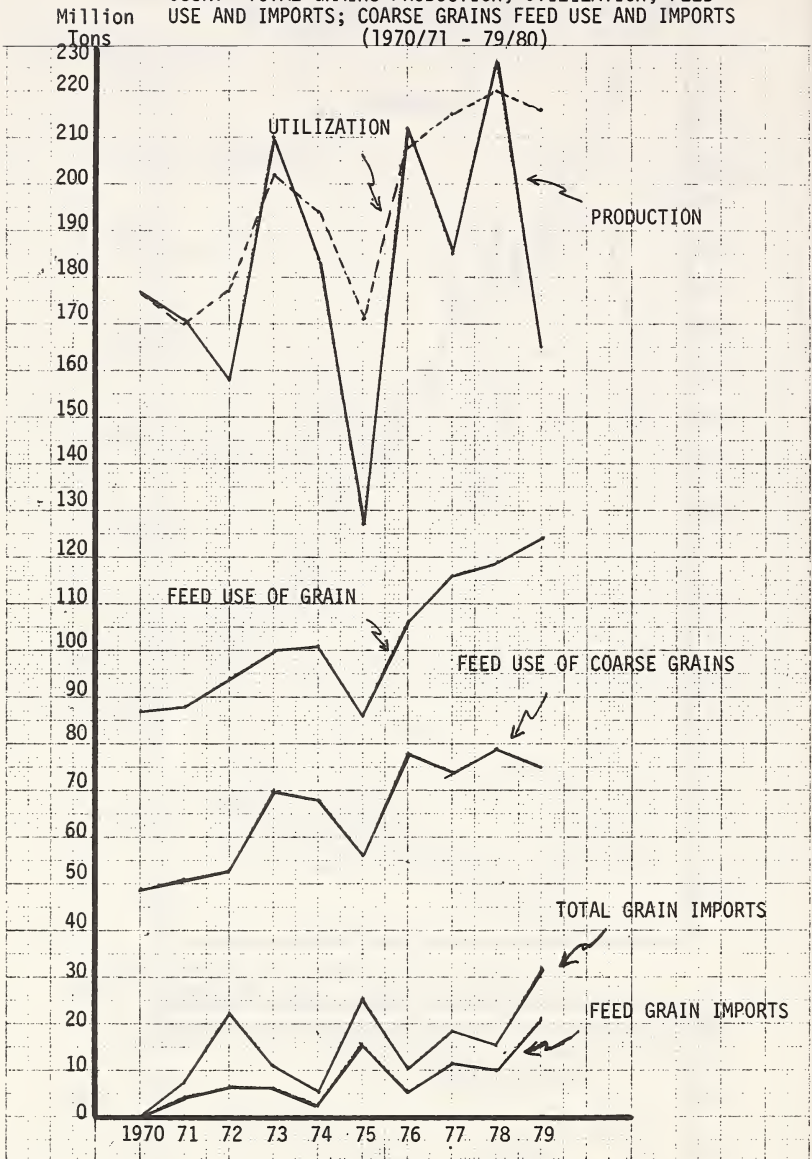


Chart 4
World Excluding U.S. and USSR
Coarse Grains: Production, Utilization
and Trade (1970/71 - 79/80)

Million Tons

500

450

400

350

0

UTILIZATION

PRODUCTION

Million
Tons

80

70

60

50

40

30

20

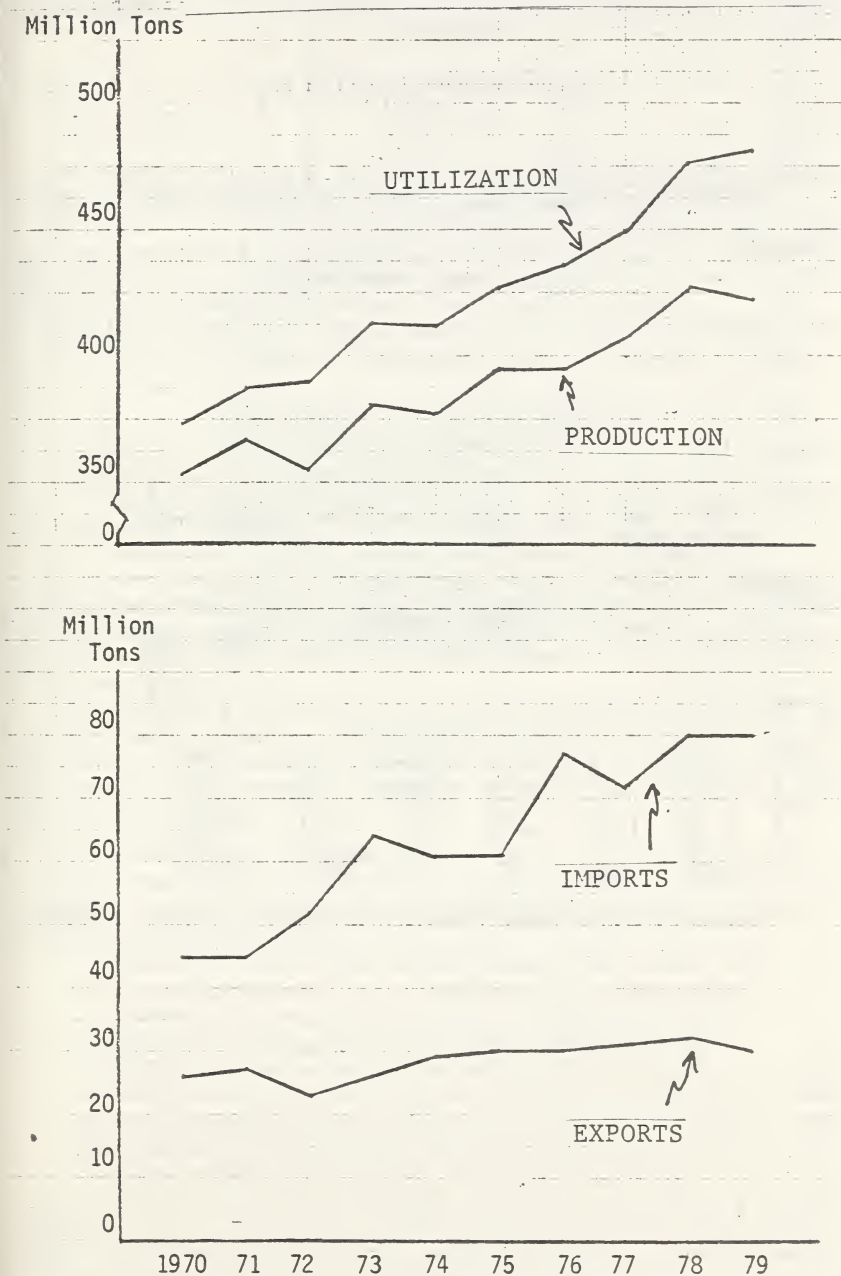
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0

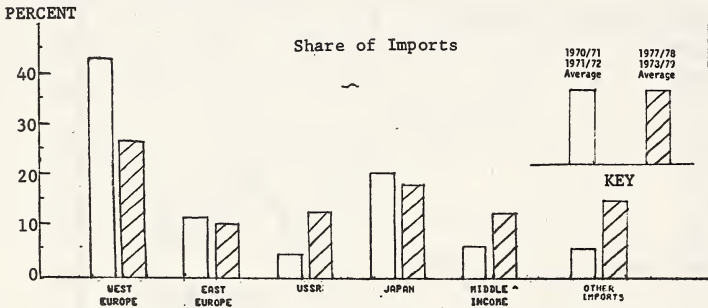
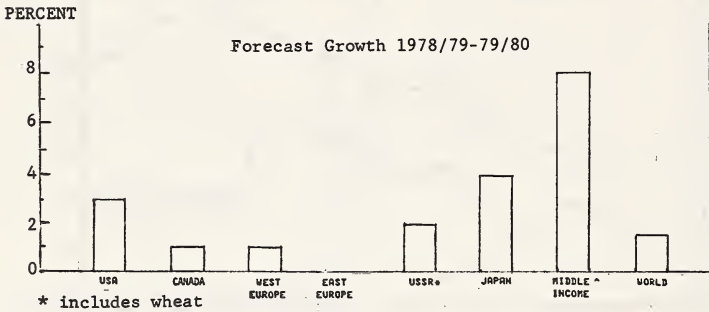
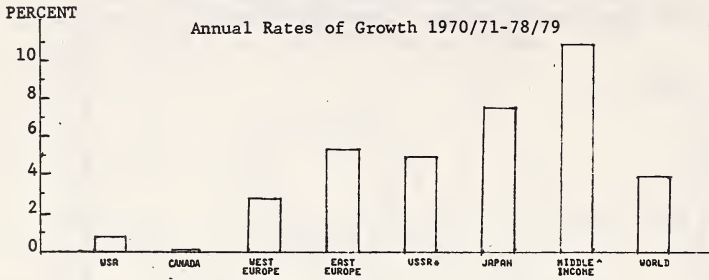
IMPORTS

EXPORTS

1970 71 72 73 74 75 76 77 78 79



Selected Market Areas: Growth in Feed Use of Coarse Grains and
Shares of World Imports of Coarse Grains



^ includes S. Korea, Taiwan, Malaysia, Iran, Venezuela, Mexico, & Brazil

DISCUSSION OF WORLD AND U.S. OUTLOOK FOR FEED GRAINS

(By Maurice P. Brannon, Cargill)

It is customary to begin an outlook by examining where we've been, where we are and where we're going. I plan to follow that custom.

But, I also want to do something less customary. I want to begin this feed grains outlook by briefly talking about the evolution of world food demand. An error commonly made in analyzing the world food situation is the distinction between need, want, and demand.

To better understand much of what has been happening in agriculture over the past couple of decades, let's redefine some basic terms.

"EVOLUTION OF WORLD FOOD DEMAND"

"Need"—is what the other fellow thinks is good for me. It's what the nutritionist says is an adequate diet.

"Want"—is what I would like to have if I had my choice. I may not be able to pay for it, but I would reach for it.

"Demand"—is what I choose to buy when I can afford it.

Much of the world food "needs" and "wants" that were being discussed during the 1960's became world food "demand" in the 1970's. The dollar value of U.S. farm exports rocketed upward more than five-fold from 1969 to 1979 while net farm income more than doubled for the same period.

Yes, there was a "need" for more food in many areas of the world in the mid-1960's. It was a mistake, however, to call that need "demand" or encourage U.S. farmers to increase production to fill that demand. The period was followed by increases in farm output, surpluses and depressed farm prices.

Strong world feed grain demand

Major efforts around the world to improve diets via meat have converted the needs and wants into the present strong demand (chart 1). Several factors can be cited:

Cheap U.S. feed grain policy during the 1960's and early 1970's—an indication that we would be a reliable supplier.

Economic development in many countries that improved incomes and thus, demand for better diets (charts 2 and 3).

Political pressures that forced national leaders to place priority on food. Good examples is the Soviet Union and Eastern Europe who are repeatedly faced with wide swings in year-to-year crop production. Political reality has shown they cannot afford to reduce the quality of their diets.

It is difficult to disagree with Mr. Rudbeck's assessment of record 1979-80 world utilization and trade. The 2.5 billion bushel level of 1979-80 U.S. corn exports may be slightly optimistic by 50-75 million bushels because of some clouds on the horizon. The most obvious is

transportation. Record export demand for grain and oil seeds is straining transportation capabilities to their limits, and difficulties in solving these logistical problems should not be underestimated. Still, it is important to recognize that U.S. handling capacity has continued to expand. Our logistical system has consistently managed to move larger quantities of grain to export terminals each year (charts 4 and 5).

U.S. feed grain prices to rise?

The 1979-80 season average price for corn is currently forecast at \$2.35 to \$2.65 per bushel, above the 1978-79 level of \$2.20. But a number of significant factors are likely to affect U.S. feed grain prices and trade in the next few months. Factors to watch include:

Livestock and poultry producers' reaction to the cost-price squeeze, which will have an impact on domestic feed usage;

The levels of corn imports by the Soviet Union;

Winter weather's influence on barge, rail and truck movement of grain to export facilities; a siege of bad weather quite likely would reduce export outflow;

Feed grain crop prospects in the Southern Hemisphere (Argentina, Australia, and South Africa);

Final 1979 corn production estimate—many traders and analysts believe it will be nearer 7.50 billion bushels than the current USDA estimate of 7.39 billion bushels. If true, corn stocks as of September 30, 1980 most likely will exceed the 1978-79 level. Such a shift toward building stocks in a year when the U.S.S.R. could purchase 25 million metric tons of U.S. feed grains and wheat and when other world supplies of feed grains are expected to be depleted, clearly has softened prices in the past 30 days.

Changes in the 1980 farm program—particularly the level of target prices with no set-aside and what modifications, if any, are made in the farmer-held grain reserve; and

Inflation.

Good long-term outlook for U.S. exports

If people around the world are to eat better, more food and feed stuffs must move from countries that can produce it to those who are failing to keep up—because of a lack of resources, basically good agricultural land. But will they be able to pay for it? Will their needs become effective demand?

Lessons that the U.S. learned during the 1970's should make one optimistic on that question. Many of the developing nations have become good customers for our farm products.

A realist knows that the North American continent, primarily the United States and Canada, has sizable underdeveloped land areas. But unless there is a much better price incentive to attract investment capital, this land will not be transformed into intensive crop cultivation. And with the cost of energy rising daily, the price incentive must go up.

U.S. farmers should be in a favored position as the number of feed grain exporters in the world are shrinking and the number of importers are growing. Farming will continue to be a prosperous business for efficient producers.

It is expected the world will become increasingly dependent upon the United States to supply feed and food stuffs. However, since U.S.

farmers will likely never be able to produce enough to solve the world's food problems, individual countries must improve their agricultural productivity to fill this gap.

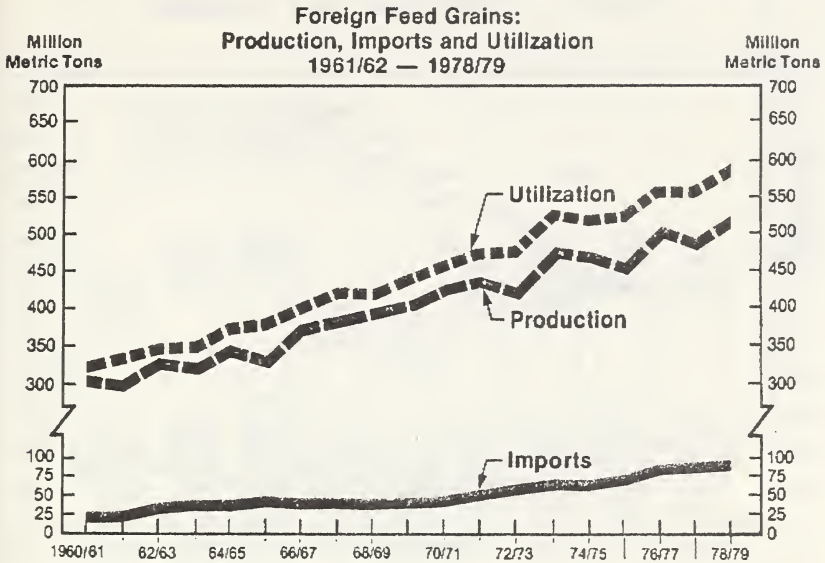


CHART 1

Per Capita Meat Consumption vs. Per Capita Income — 1976

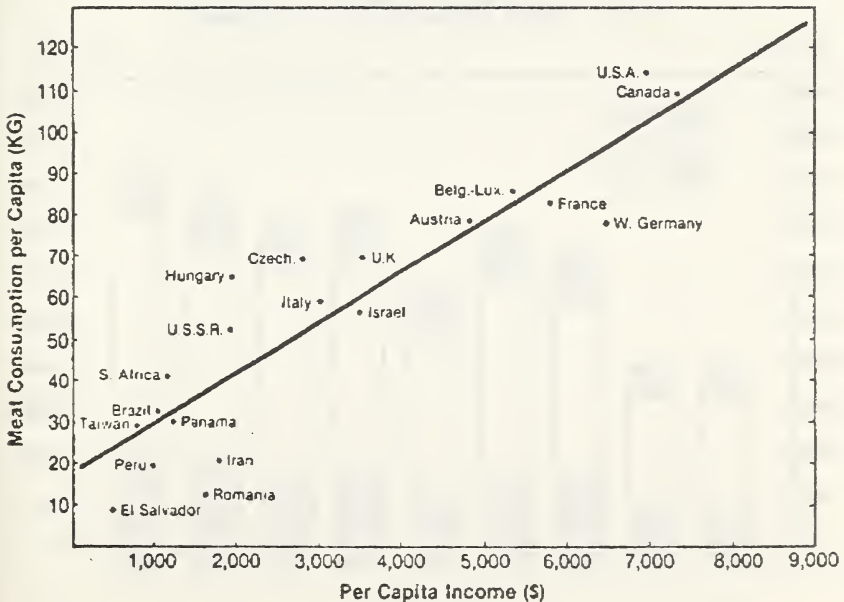


CHART 2

South Korea: Feed Grain Usage Vs. Per Capita Income, 1966—78

(JULY—JUNE YEAR)

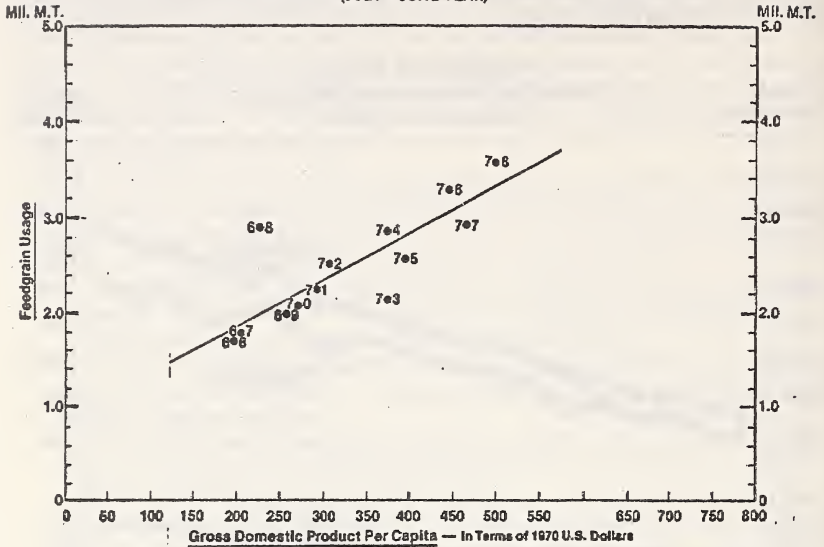


CHART 3

U.S. Grains & Soybeans/Flaxseed Exports By Port Area July — June Year, 1970/71 — 1978/79

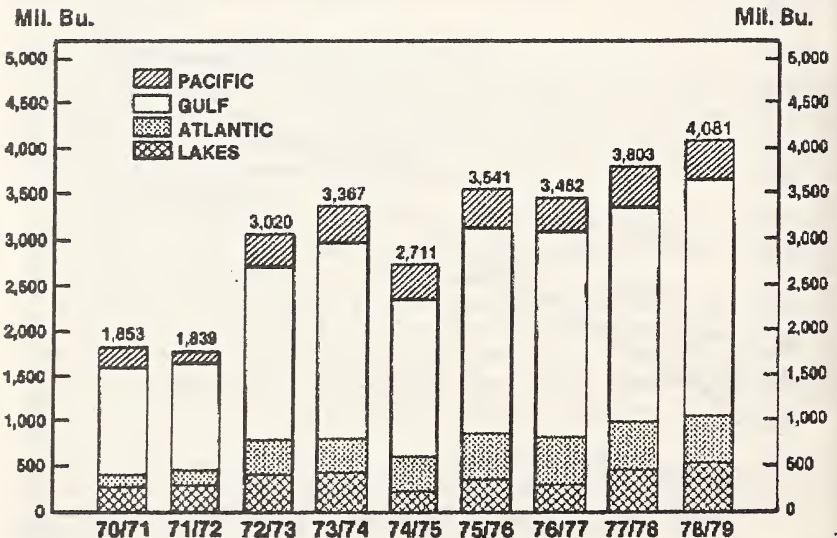


CHART 4

**Canadian Grains & Rapeseed/Flax Seed
Exports By Port Area
August — July Year, 1970/71 — 1978/79**

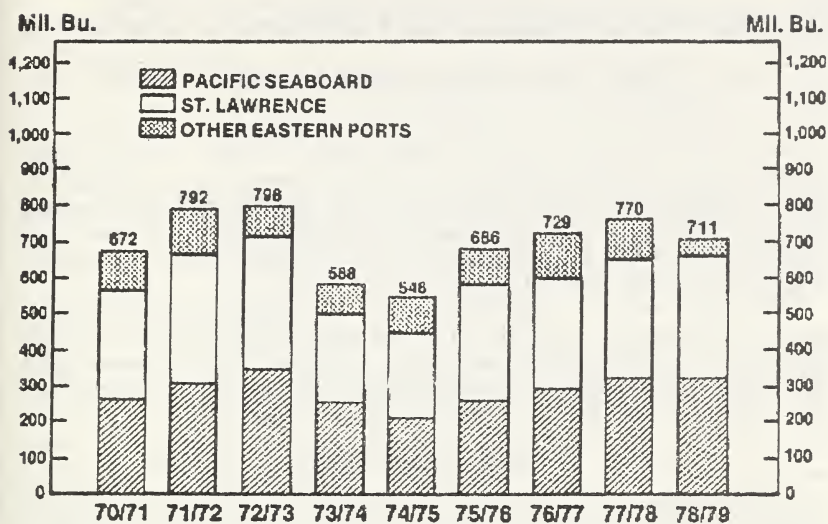


CHART 5

U.S. AND WORLD FEED GRAIN OUTLOOK: DISCUSSION

(By Larry D. Jones, Senior Economist Chase Econometric Associates, Inc.)

Dr. James Rudbeck's paper, "Feed Grains: World and U.S. Outlook" does an excellent job reviewing the historical and current situation for feed grains both here in the U.S. and abroad. His analysis clearly indicates the linkages that exist between the world feed grain situation and what happens here in the United States, particularly with respect to the Soviet Union.

This paper seeks to contribute to Dr. Rudbeck's scenario for crop year 1979-80 in two respects: First, we present some of the risks associated with his scenario for both the world and U.S. feed grain situation. Second, this paper provides alternative Chase Econometrics' estimates for U.S. feed grains in the 1979-80 crop year.

WORLD FEED GRAINS

Dr. Rudbeck's analysis indicates that "World coarse grain trade is forecast to rise 12 percent to a record 101 million tons. This level of trade represents a sharp step-up in imports by the Soviet Union, but also gains in Western Europe, Japan, and a number of developing countries. Total shipments by the other major feed grain exporters . . . are not expected to expand, but to some extent will depend upon the outcome of . . . crops that are now just being planted."

There are, however, risks associated with this projected increase that could reduce the trade figure below the USDA projection. These risks involve the world's demand for feed grains. Specifically we see demand risks of (1) the state of the world economy, (2) the strength of the U.S. dollar, and (3) the world trade concern of oil versus food.

Before considering these points, it is important to establish where U.S. feed grain exports go. It is important as, even by Dr. Rudbeck's numbers, U.S. feed grain exports will contribute about 70 percent of the world's trade in feed grains. Using corn exports in 1978-79 as an illustration, 34 percent of our corn exports went to Western Europe, while 32 percent went to the centrally planned economies. Japan took 17 percent of our corn exports while other regions took the remaining 17 percent. These numbers have changed rather dramatically since 1974 when Western Europe bought 53 percent of our own corn exports and the centrally planned economies took only 12 percent. Even so, the 1979 data reveal that our major trading partners, Western Europe and Japan, still take 50 percent of our corn exports. These economies are not closely linked to our own.

Hence, one of the major uncertainties impacting on world feed grain trade is the health of the world economies. Our own forecast highlights for the world economy are:

World GNP, excluding the United States, should grow 3.9 percent this year, but slow to only 2.3 percent in 1980.

Aggregate European GNP will only increase 1.8 percent in 1980.

World inflation continues eroding consumer purchasing power and leading to a sharp slowdown in the rate of growth in consumer spending.

Growth in overall world trade is forecast to come to a virtual standstill during the next 6 to 9 months because of slowing consumer demand.

As a consequence of a slowing world economy, particularly by our major trading partners, we see one reason why the projected growth in feed grain trade might not be as great as that projected by Dr. Rudbeck.

During the past several years the demand for exports of U.S. feed grains has increased because of the slide of the dollar relative to the major currencies such as the yen and the German mark. Our estimates now indicate that barring a large personal tax cut in 1980 the dollar in foreign exchange markets will remain firm, thus reducing the stimulus to buy U.S. grains.

A third risk factor that may cause world grain trade and U.S. feed grain exports, in particular, to be lower than expected involves countries' possible tradeoffs between importing oil versus importing food. Most would readily agree that countries have to eat. Yet it is also plausible that countries might dampen feed grain imports by increasing the use of fodder or slaughtering livestock at lighter weights rather than feeding to heavier weights. Our projections are for an additional 10 million cattle in the world in 1980, excluding the United States, while hog numbers increase by 27 million head, and poultry production increases about one-half million metric tons. With our anticipated slowdown in the world economies and the associated declines in consumer spending, the risk associated with the base scenario is that these livestock increases might not materialize. Consequently, world demand for feed grains might not be as great as expected.

This rationale is also supported by the likelihood of an OPEC price hike of another 10 percent or more at their December meeting. The countries of Western Europe, Japan, and many of our less developed trading partners will subsequently be using more of their foreign exchange to pay for petroleum imports.

U.S. FEED GRAIN SITUATION

On the production side our analysis agrees with Dr. Rudbeck's estimate of 225 million metric tons. But on feed grain utilization, exports, and the resulting ending stocks, our own estimates differ. We feel that domestic utilization and exports will be lower than the USDA forecast of 158 and 71 million metric tons, respectively. Our projected ending stocks, as a consequence, are higher at 47 million metric tons for 1979-80.

Considering exports, we are somewhat more pessimistic than the USDA estimates for the reasons advanced earlier, including a slower world economy, a more stable U.S. dollar, and rising OPEC prices. In addition, there is the danger of taking recent export announcements and assuming this optimism will extend into 1980. While we also are optimistic for increased exports, our optimism remains some-

what constrained by the possibility that current export clients may indeed postpone or cancel purchases later. There seems to be a common tendency for purchasing countries to "jump on the bandwagon" when news breaks that the Russians are in the market. As the large feed grain harvest is being realized there may be a tendency on the part of some countries to postpone decisions in the hopes that the large harvest will drive prices down. For these reasons we project feed grain exports at 69 million metric tons or 3 percent below the USDA forecast. While feed grain exports will likely grow at a 24.4 percent rate during the first half of the current crop year (compared to year earlier), our projections now indicate only a 7.6 percent growth rate during the last half of the 1979-80 crop year.

We are also somewhat more pessimistic than the USDA estimates of a 5-million-metric-ton increase in U.S. feed grain utilization. Our own projections are for a 2-million-metric-ton increase. Our estimate is somewhat restrained for a variety of reasons. One is our own forecast that U.S. poultry numbers will be slowing in 1980. Our budgets indicate that losses in 1979 may be the most severe since 1974 when the subsequent growth in 1975 broiler output rose only 0.6 percent. Our 1980 projection is that poultry output will slow to 1 or 2 percent.

A second reason for a lower utilization of feed grains than some other estimates is that we are forecasting that hog numbers will collapse by mid-1980; hence, not as much grain will be required.

Finally, the recent cattle on feed numbers indicate that increases in cattle feeding will not be back as quick as some earlier estimates.

As a consequence of lower utilization and exports as compared to the USDA forecast we foresee a 47-million-metric-ton ending stock. Under this scenario we expect the following feed grain farm prices for 1979-80:

[Dollars per bushel]

	Corn	Grain sorghum	Oats	Barley
Average price.....	2.48	2.24	1.32	2.05
Range ¹	(2.45-2.55)	(2.21-2.30)	(1.30-1.36)	(2.02-2.10)

¹ Range that would most likely be the average price for the year.

TABLE 1.—U.S. CORN EXPORTS

[Percentage by regions]

	Crop year—					
	1974	1975	1976	1977	1978	1979
Western Hemisphere.....	11	5	5	7	7	7
Western Europe.....	53	42	52	36	30	34
Centrally planned countries ¹	12	31	19	28	30	32
Japan.....	17	15	16	18	17	17
Other Asian.....	4	5	6	9	5	7
Africa.....	3	2	2	2	2	3
Total.....	100	100	100	100	100	100

¹ Eastern Europe, Russia, China.

TABLE 2.—U.S. FEED GRAINS SUPPLY/DISAPPEARANCE, 1976-77 AND 1979-80¹

[Million metric tons]

	1976	1977	1978	² 1979
Total carry-in.....	17	30	41	46
Production.....	193	203	217	224
Supply.....	211	233	258	270
Domestic use.....	130	136	153	155
Exports.....	51	56	60	69
Disappearance.....	181	192	213	224
Total carryout.....	30	41	46	47
Cumulative reserve.....	0	8	21	0
Market carryout.....	30	33	26	47
Reserve entry.....	0	8	12	-21

¹ USDA defined crop years.² CEAI projections.TABLE 3.—U.S. CORN SUPPLY/DISAPPEARANCE, 1976-77 AND 1979-80¹

[Millions of bushels]

	1976	1977	1978	² 1979
Total carry-in.....	399	884	1,104	1,285
Production.....	6,266	6,425	7,082	7,390
Supply.....	6,665	7,310	8,186	8,675
Domestic use.....	4,100	4,260	4,762	4,884
Exports.....	1,684	1,948	2,140	2,450
Disappearance.....	5,784	5,208	6,902	7,334
Total carryout.....	884	1,104	1,285	1,341
Cumulative reserve.....	0	246	634	0
Market carryout.....	884	858	651	1,341
Reserve entry.....	0	246	388	-634

¹ Crop year beginning Oct. 1 of year denoted.² CEAI projections.TABLE 4.—U.S. GRAIN SORGHUM SUPPLY/DISAPPEARANCE, 1976-77 AND 1979-80¹

[Millions of bushels]

	1976	1977	1978	² 1979
Total carry-in.....	51	91	191	159
Production.....	720	793	748	817
Supply.....	771	884	939	976
Domestic use.....	434	480	580	545
Exports.....	246	213	200	245
Disappearance.....	680	693	780	790
Total carryout.....	91	191	159	186
Cumulative reserve.....	0	42	92	0
Market carryout.....	91	149	67	186
Reserve entry.....	0	42	50	-92

¹ Crop year beginning Oct. 1 of year denoted.² CEAI projections.

TABLE 5.—U.S. OATS SUPPLY/DISAPPEARANCE, 1976-77 AND 1979-80¹

[Millions of bushels]

	1976	1977	1978	² 1979
Total carry-in.....	205	165	311	289
Production.....	546	751	601	531
Supply.....	752	916	912	820
Domestic use.....	578	596	612	610
Exports.....	10	11	13	9
Disappearance.....	588	607	625	816
Total carryout.....	165	311	289	241
Cumulative reserve.....	0	26	80	0
Market carryout.....	165	285	248	241
Reserve entry.....	0	26	54	-80

¹ Crop year beginning June 1 of year denoted.² CEAL projections.TABLE 6.—U.S. BARLEY SUPPLY/DISAPPEARANCE, 1976-77 AND 1979-80¹

[Millions of bushels]

	1976	1977	1978	² 1979
Total carry-in.....	128	126	172	228
Imports.....	11	9	10	12
Production.....	372	420	447	364
Supply.....	511	555	629	604
Domestic use.....	319	327	376	371
Exports.....	66	57	26	35
Disappearance.....	385	383	401	407
Total carryout.....	126	172	228	197
Cumulative reserve.....	0	23	42	0
Market carryout.....	126	149	186	197
Reserve entry.....	0	23	19	-42

¹ Crop year beginning June 1 of year denoted.² CEAL projections.

TABLE 7.—FEED GRAIN ACREAGE PLANTED, 1974-80

[In millions]

	Corn	Grain sorghum	Oats	Barley	Total
1974.....	77.9	17.6	17.0	8.7	121.2
1975.....	78.6	18.1	16.5	9.3	122.5
1976.....	84.4	18.4	16.7	9.2	128.7
1977.....	83.6	17.0	17.7	10.6	128.9
1978.....	79.7	16.5	16.4	10.0	122.6
1979.....	79.8	15.6	14.1	8.1	117.5
1980 ¹	82.7	16.0	14.8	8.9	122.4

¹ CEAL projections.

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U.S. AND WORLD COTTON OUTLOOK

(By Samuel Evans, agricultural economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

One of the more interesting features of the U.S. cotton market of recent years has been the dramatic increase in our export potential. During 1978-79, for example, exports accounted for nearly 50 percent of U.S. cotton disappearance, and in the current season, exports may exceed domestic mill use for the first time since 1937-38.

Increasingly, the outlook for U.S. cotton is influenced by conditions abroad. Therefore, we will begin the assessment of the cotton outlook with a review of world supply and demand prospects, especially as they relate to the U.S. export potential.

THE U.S. EXPORT MARKET

Export potential

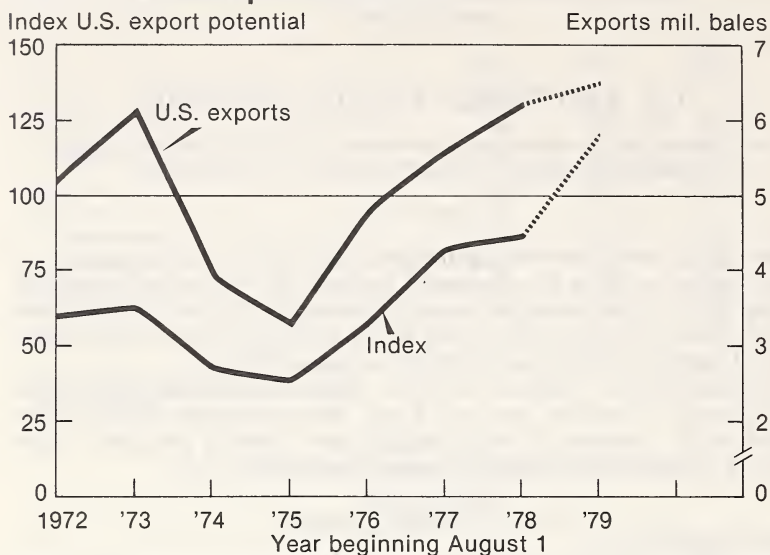
The fundamental elements in the export potential for U.S. cotton are (1) the gap between foreign supplies and consumption and (2) U.S. export availability. To bring these factors together into a single measure, an index of U.S. export potential was constructed. This index for any year is equal to: (U.S. production plus beginning stocks minus mill use) divided by (foreign production plus beginning stocks minus mill use). As figure 1 indicates, the index was highly correlated with U.S. exports during recent years. Current projections of U.S. and foreign supply and use indicate a sharp increase in the 1979-80 U.S. export potential.

Let's now look at the details behind this bright outlook for U.S. cotton exports.

World cotton production

World cotton production is expected to increase in 1979-80 to 63.8 million bales (480-pound net), a 7-percent increase over last year's 59.8 million, according to the Foreign Agricultural Service (FAS) of the USA. The United States is responsible for most of the increase with its 1979-80 cotton crop estimated at 14.4 million bales, 3.5 above that of last year. Foreign production may be up only about 0.6 million bales from 1978-79, totaling 49.5 million. Higher yields are anticipated this season, as the world cotton area is estimated to increase less than 1 percent to 80 million acres. Foreign area could decrease by 0.3 million acres to 66 million, while the U.S. area increases about 0.7 million acres.

Index of U.S. Export Potential



USDA

Neg. ESCS 79 (10)

FIGURE 1

The Soviet Union is expected to recover from last year's disappointing crop with the 1979-80 production estimated at 12.8 million bales. In spite of some early setbacks, expanded irrigation area resulted in a slight area increase to 3.1 million hectares. Cotton production in the People's Republic of China (PRC) ran into some problems late in the season and is now estimated at 9.8 million bales. Area appears to have decreased this year to about 11 million acres. The Government has increased incentives for food crops in an effort to become more self-sufficient. India will probably suffer the largest production decrease of any country in 1979-80, with its crop estimated at 5.75 million bales, compared to 6.26 million last year. The monsoon was very erratic, causing drought in many areas and flooding in others. As a result, India's production is expected to be pulled down by low yields.

World cotton trade and U.S. exports

World exports are expected to approach 20 million bales in 1979-80, compared to 19.5 million in 1978-79, according to FAS. The continued strong world demand plus the apparent decline in PRC cotton production are the main reasons for the increase. Cotton consumption and imports in the textile producing countries are generally expected to expand this season, with Korea showing the greatest growth. Imports by the PRC are projected at 2.5 million bales, 300,000 above the estimate for 1978-79. Cotton imports by Western Europe will probably show only a marginal increase due to strong pressure from textile imports. The estimated record crop in the U.S.S.R. should provide greater export availability. The Soviets priced their cotton above U.S. cotton most of the past year, but in September the price of U.S.S.R. cotton dropped below the U.S. price. Many other exporting countries,

however, have less cotton available for export in 1979-80 because of lower beginning stocks.

The U.S. export estimate for 1979-80 is 6.5 million bales (± 0.9 million), up from 6.2 million last season. Shipments the first 2 months were slightly below the heavy movement a year earlier. Commitments, exports plus outstanding sales, as of October 14 totaled 5.7 million bales, however. This is more than a million bales ahead of the total at this time a year ago. The PRC has purchased about 1 million bales, compared to shipments in 1978-79 of 648,000 bales. If the world economic slowdown, which has hovered over the market this year, does not materialize or is fairly mild and the Chinese crop falls below the current estimate of 9.8 million bales, U.S. exports could be somewhat higher than the present estimate of 6.5 million bales. While there is no accurate measure of the maximum export capacity, problems developed in moving cotton from interior warehouses to export position last season. A repeat of those problems could result in a 1979-80 commitment of 7.5 to 8 million bales, with an unshipped balance on August 1, 1980, even higher than the 0.9 million bales carried over on August 1, 1979.

THE DOMESTIC COTTON MARKET

Total fiber use

As figure 3 indicates, textile mill activity is highly related to general economic activity, measured here by the Index of Industrial Production.

Preliminary data for the first three quarters of 1979 show that the textile industry performed fairly well in view of the up-and-down performance of the general economy. Mill use of all fibers may total nearly 13 billion pounds this year, up from 12.4 billion in 1978. It is doubtful that this level of activity can be sustained during the next few months in light of the bleak general economic prospects.

World cotton consumption

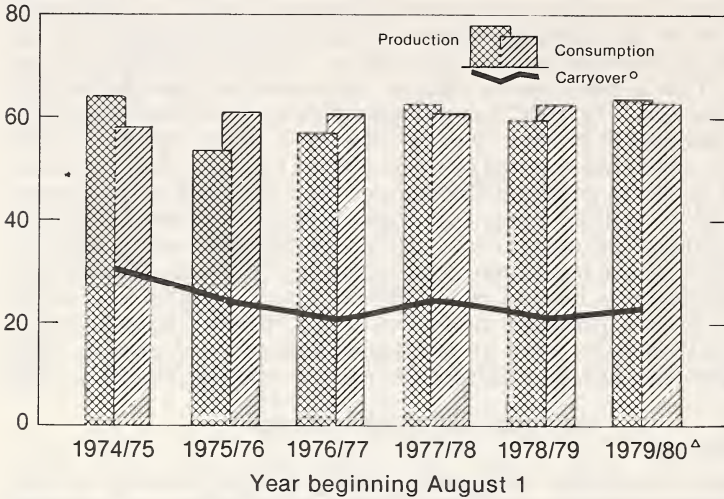
World cotton consumption during 1979-80 is now placed at 63.1 million bales by FAS, slightly above the 1978-79 record-high level of 62.8 million. Consumption in the United States is expected to decline to 6.2 million bales, compared with 6.4 million last season. Foreign mill use could reach nearly 57 million bales, up from last season's record-high 56.4 million.

Total fiber use

If current estimates for 1979-80 world cotton production and consumption are realized, world stocks will increase about 1 million bales during 1979-80 to 22.6 million on August 1, 1980. U.S. cotton stocks are expected to increase about 1.7 million bales, but foreign stocks are projected to decline 650,000 bales below the relatively low 17.6 million on August 1, 1979. Foreign non-Communist importing countries are expected to reduce stocks about 460,000 bales, with most of the decline occurring in India. In general, importing countries are showing less inclination to carry stocks because of the possibility of an economic slowdown and the higher interest rates. Stocks in the Communist countries, while already fairly low, will probably slip about 200,000 bales in 1979-80. The chief reason for the decline is an expected drop in stocks in the PRC. A strong desire to expand textile exports in order to earn foreign exchange, combined with the smaller than earlier expected level of production, places great pressure on the current stock level.

World Cotton Production, Use and Carryover

Mil. bales *



*480-pound net weight bales. ^oEnding carryover. ^ΔEstimated.

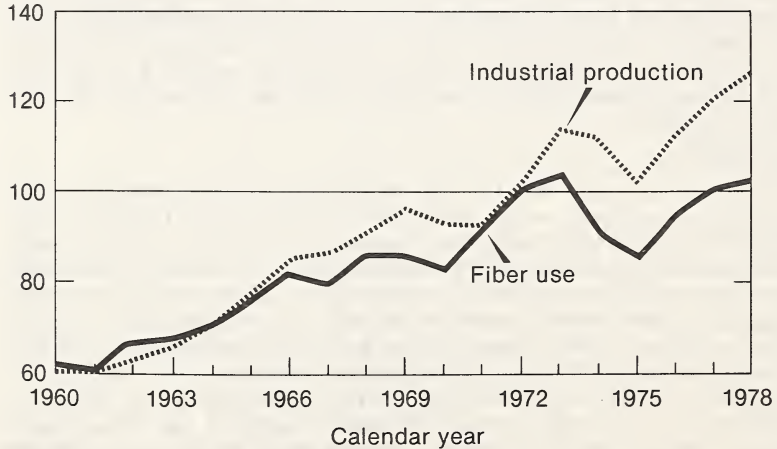
USDA

Neg. ESCS 2924-79 (10)

FIGURE 2

U.S. per Capita Fiber Consumption and Industrial Production

% of 1972



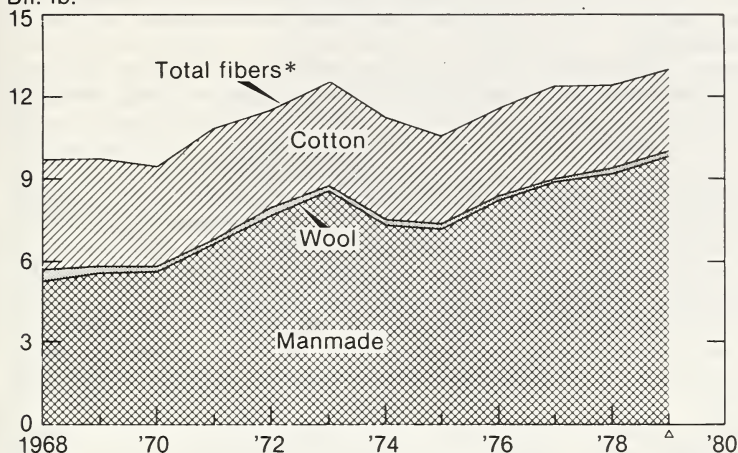
USDA

Neg. ESCS 3156-79 (10)

FIGURE 3

U.S. Mill Consumption of Fibers

Bil. lb.



*Does not include flax and silk. ^ΔEstimated.

USDA

Neg. ESCS 2923-79 (10)

FIGURE 4

Partly responsible for continued strong domestic mill fiber demand is the improving U.S. textile trade deficit. During the first 7 months of 1979, the total trade deficit was 209 million pounds, raw fiber equivalent, compared with 556 million during the year-earlier period.

Both cotton and manmade fiber textiles were exported from the United States in record quantities during the first 7 months of 1979. As a result, and coupled with smaller imports, the January-July deficit in cotton textile trade of 173 million pounds was nearly 50 percent below the year-earlier period; manmade fiber textile exports exceeded imports by 21 million pounds during the first 7 months of this year, compared with a 153-million-pound deficit in the year-earlier period.

Cotton's share of total mill use in 1979 may decline to a record low of 23.6 percent, compared with last year's 24.5 percent. Cotton's share of domestic fiber use (mill use plus the raw fiber content of textile imports less exports) will be somewhat higher, around 25 percent. Total domestic use of all fibers in 1979 is likely to be around 13.3 billion pounds, only slightly above last year's total of 13.2 billion. Domestic use may be more reflective of the sluggish U.S. economic activity than mill use.

Cotton mill use to decline

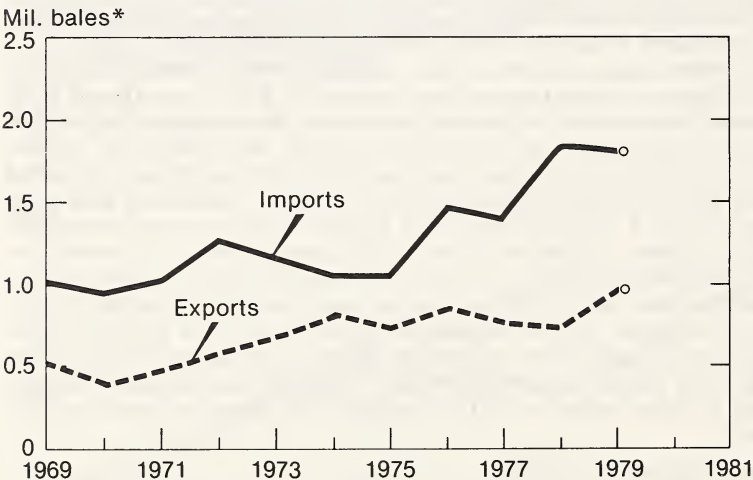
Cotton used in domestic textile mills is expected to decline marginally to 6.2 million bales (± 0.4 million) in 1979-80, from 6.4 million last season. This forecast assumes a moderate slowdown in the U.S. economy during the next few months, and cotton production around the level of the October 1 forecast. Weaker economic growth than currently anticipated by most forecasters could result in cotton use

slightly below 6 million bales; stronger than expected economic activity could result in mill use increasing to just over 6.5 million bales, especially in view of cotton's improving price competitiveness with polyester staple, and the United States improved trade balance in textile products.

The price differential between cotton and manmade fibers has narrowed significantly since last winter. Last December, for example, U.S. mills paid 73 cents a pound for SLM $1\frac{1}{16}$ -inch cotton, 53 cents for polyester staple, and 61 cents for rayon staple. This September, mills paid 69 cents a pound for cotton, and 65 cents for polyester and rayon. And, rayon list prices were expected to increase 5 cents a pound in October based on recent announcements by fiber producers. While significant price-based substitutions among fibers are not likely in the short run, more attractive prices relative to manmade fibers should, at least, enable cotton to hold its own and perhaps slightly improve its market share in the coming months. Moreover, while future oil price increases will raise production costs for both manmade fibers and cotton, there is no doubt that the impact on manmade costs will be greater.

The cotton textile trade deficit will total around 0.6 million bales, raw fiber equivalent, in calendar 1979, sharply below last year's record deficit of 1 million [fig. 5]. During the first 7 months of 1979, cotton textile exports were 44 percent above the year-earlier total, and imports were 15 percent below a year earlier. This turnaround reflects, in part, the declining value of the dollar against foreign currencies.

Cotton Textile Trade



*480-pound raw cotton equivalent bales. ○ Estimate based on 8 months data.

FIGURE 5

Early-season mill use above expectations

During August–September, the first 2 months of the 1979–80 season, domestic cotton mill use exceeded year-earlier rates of use by a healthy margin. The seasonally adjusted annual rates of use were 6.2 million bales and 6.6 million, respectively, in August and September. The September rate of cotton use was the highest recorded since November 1977. It is highly unlikely that the current rate of use can be maintained during the rest of 1979–80.

U.S. cotton production up sharply

Based on a survey taken about October 1, the Crop Reporting Board forecast all cotton production for 1979–80 at 14.4 (± 0.8) million bales, 32 percent above last season. The survey indicated that producers expect to harvest 13.1 million acres out of 14.1 million planted, an abandonment of 7 percent. Average yield was forecast at a record-high 528 pounds per harvested acre, well above last season's abnormally low 421 pounds.

In the Delta States, a crop of 2.8 million bales is forecast, 4 percent below last season and the smallest since 1975. Average yield in the Delta is forecast at 549 pounds per harvested acre, and acres for harvest are estimated at 2.47 million, the lowest since 1967–68 when an acreage diversion program was in effect.

Producers in the Southeast could harvest 626,000 bales this fall. Both acreage and yield are slightly above last season. Average yield was placed at 480 pounds, the highest since 1964.

In the Southwest—Texas and Oklahoma—cotton production is forecast at 6.2 million bales, 47 percent above last season. Estimated average yield is 393 pounds per harvested acre. Planted and harvested acreage—8.3 million and 7.5 million, respectively—account for almost 60 percent of the U.S. totals.

Cotton production in the West—California, Arizona, and New Mexico—was forecast at 4.8 million bales, up sharply from last season's 3.2 million. More normal yields of 928 pounds per harvested acre are expected in the West this season, up from 1978–79's insect-reduced 709 pounds.

Production moves west; per pound costs lower

The Southwest and West regions could account for 76 percent of U.S. cotton production this season according to the October survey. This would be a record share for these regions, and the first time it has topped 70 percent.

Lower per pound production costs in the Southwest and West are behind the shift in cotton production, along with higher opportunity costs (soybean prices) in the Eastern Belt. More market-oriented farm programs in recent years have also strengthened the tendency for production to move westward.

Although per acre costs of producing cotton were greater this year, the combination of higher yields and proportionally more cotton in the Southwest and West resulted in lower per pound costs than in 1978. Total costs, excluding land costs, of producing upland cotton in 1978 were estimated at 66 cents a pound, up from 52 cents in 1977; yields averaged sharply lower in 1978. Costs per planted acre, excluding land costs, were projected at \$279 in 1979, up from \$258 last year,

according to a report issued June 15, 1979, by the U.S. Senate Committee on Agriculture, Nutrition, and Forestry. This projection does not reflect all of the petroleum price increases this year, which will push cotton production costs even higher. Nevertheless indications are that production costs could fall to 55 to 60 cents a pound, based on the October 1 yield forecast. Net Costs—excluding projected cottonseed value—could range from 46 to 51 cents a pound, compared to last season's 57 cents.

TABLE 1.—U.S. COTTON SUPPLY AND DEMAND (ALL KINDS)

[Million 480-lb. bales]

Item	1978-79	1979-80 projected ¹	
		Base	Probable variation
Beginning stocks.....	5.3	4.0	-----
Production.....	10.9	14.4	±0.8
Total supply.....	16.2	18.3	±.8
Mill use.....	6.4	6.2	±.4
Exports.....	6.2	6.5	±.9
Disappearance.....	12.5	12.7	±.7
Ending stocks ²	4.0	5.7	±1.0

¹ Base reflects October cotton production estimates.² Chances are 2 out of 3 that the outcome will fall within this range.³ May not equal supply less disappearance, primarily due to varying bale weights.

U.S. Cotton Production, Use and Carryover

Mil. bales*

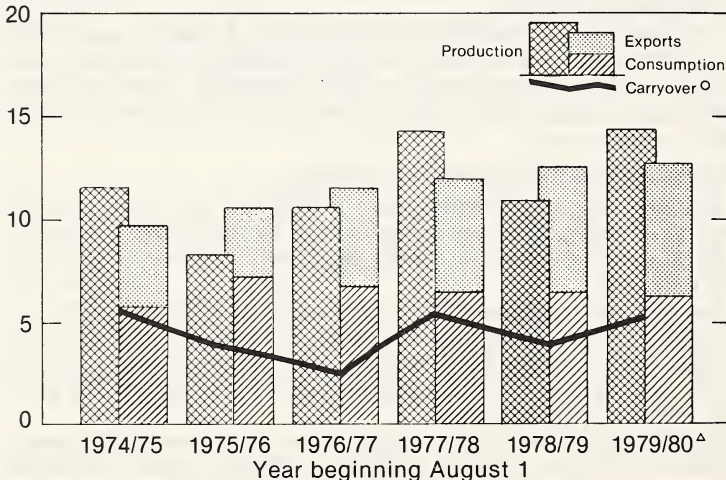
*480-pound net weight bales. ○Ending carryover. ^ΔPreliminary.

FIGURE 6

U.S. stocks to increase

The early season forecasts of U.S. cotton supply and disappearance indicate that stocks would increase to 5.7 million bales on August 1, 1980, compared to relatively low beginning stocks of 4 million (figure 6 and table 1).

Larger stocks will put pressure on prices

Cotton prices have fluctuated significantly since 1973-74 as supplies alternately tightened and expanded relative to demand. For example, during 1976-77, 80 percent of available U.S. cotton supplies were either exported or processed in domestic textile mills. The average spot market price for SLM $1\frac{1}{16}$ -inch-cotton for that season with 71 cents a pound. With the large crop in 1977-78, the ratio of disappearance to supply fell to 69 percent, and the average price dropped to 53 cents. Supplies tightened again in 1978-79 with disappearance increasing to 78 percent of total supply, and the average spot price climbed to 62 cents a pound. There is a high probability that the ratio of cotton disappearance to supply will fall in 1979-80, possibly ranging from 64 to 75 percent. The midpoint of this range—70 percent—is near the 1977-78 ratio. However, prices during 1979/80 are supported by a loan rate of 50.23 cents a pound (SLM $1\frac{1}{16}$ inch, average location) while those in 1977-78 were supported by a lower loan rate of 44.63 cents (figure 7).

Spot prices of SLM $1\frac{1}{16}$ inch cotton averaged 62 cents a pound this August-September, 2 cents above a year earlier. Farm prices of upland cotton were also 2 cents above a year earlier, averaging 59 cents a pound. The current level of prices primarily reflects a temporary shortage of cotton resulting from relatively low-carrying stocks, strong demand, and the lateness of the 1979 crop. As harvest gains momentum, prices will come under pressure as stocks build (figure 8).

Farm prices could average below target price

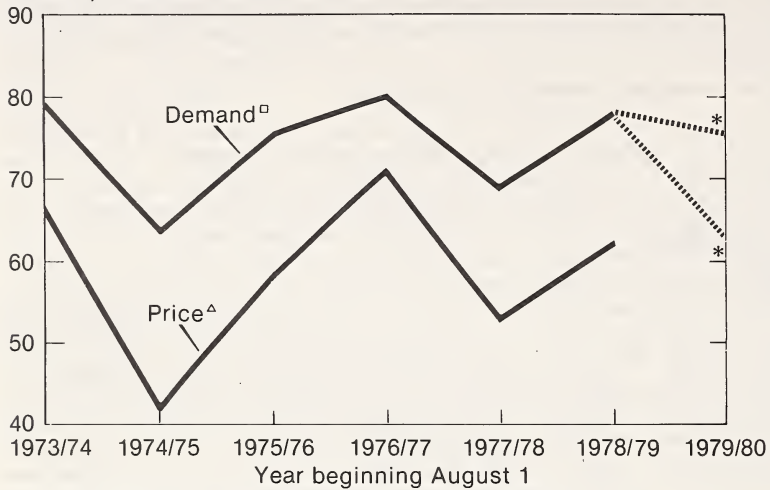
With the prospect for cotton production exceeding disappearance this season, the target price and loan programs under the Food and Agriculture Act of 1977 take on added importance. To be eligible for any benefits under the 1977 act, cotton producers who planted feed grains or wheat this year must have complied with the set-aside requirements for those crops.

Deficiency payments will be made to eligible cotton producers if the national average price of upland cotton during calendar 1979 is below the target price of 57.7 cents a pound. During the first 9 months of 1979, upland prices averaged around 56 cents a pound. Farm prices received this October-December, normally a period of heavy marketing, will be instrumental in determining whether payments will be made and the size of any payment.

Any deficiency payment would be the difference between the target price and the national average farm price. Producers who reduced their 1979 acreage to 85 percent or less of 1978 acreage would receive payments on 100 percent of this year's acreage; others would receive any payments on about 89 percent of their 1979 acreage.

Cotton: Supply, Demand, and Price

¢/lb. or percent



^Δ SLM 1-1/16 inch cotton. [□] Mill use plus exports divided by total supply.

* Likely range based on August crop report and alternative worldwide growing conditions in 1979.

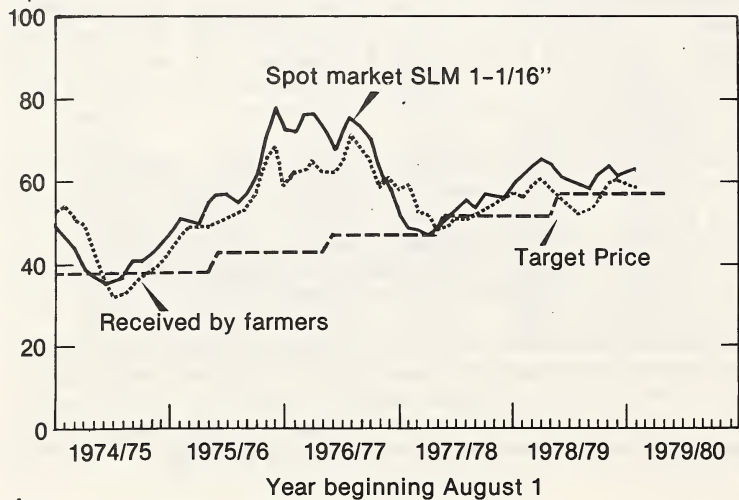
USDA

Neg. ESCS 74-79 (10)

FIGURE 7

U.S. Cotton Prices

¢ per lb.



USDA

Neg. ESCS 2597-79 (10)

FIGURE 8

1980/81 upland cotton program

Upland cotton producers will continue to operate under provisions of the Food and Agriculture Act of 1977. Current calculations indicate that the target price could increase slightly in 1980, to around 60 cents a pound, compared with 57.7 cents this year. The loan rate for SLM 1 $\frac{1}{16}$ -inch cotton at average location will be 48 cents a pound in 1980/81, the legislative minimum, compared with 50.23 cents this season.

Acreage and production prospects

Given current price expectations, cotton acreage could decline next spring, primarily in response to higher feed grain prices. Assuming no cotton set-aside, total acreage could range from 13-14 million, compared with 14.1 million this year. With a set-aside, acreage of course would be even less. No decision has yet been reached on a cotton set-aside. Regardless, the bulk of the decline in cotton plantings next spring will likely occur in the Southwest, primarily in Texas. Cotton acreage should hold its own or slightly increase in the regions where soybeans are the main competition.

If yields next season return to a more normal level, we could see a sharp drop in cotton production.

Disappearance prospects

U.S. mill use will continue to depend heavily on general economic activity, the cotton textile trade deficit, and relative fiber prices. Given that cotton is likely to be reasonably priced relative to manmade fibers, expected improvement in the U.S. economy in late 1980 and beyond could cause an increase in 1980-81 mill use.

U.S. cotton exports in 1980-81 are likely to be only slightly below the projected 6.5 million bales for the current season. Low foreign stocks and a potentially huge U.S. export carryover on August 1, 1980, should keep exports at a high level again next season.

In summary, we could see a modest decline in U.S. cotton stocks during the 1980-81 season.

284 IMPACT OF ENERGY ON INTERFIBER COMPETITION AND THE OUTLOOK FOR COTTON PRODUCERS

(By Larry D. Hauschen, agricultural economist, Federal Reserve Bank of Dallas)

Short supplies and higher prices of energy pose a major concern for this Nation's agriculture. As we all know, agriculture today is dramatically different from agriculture 100, 50, even 20 years ago. The rapid growth of production technology has led a rapid substitution of energy-intensive capital equipment for labor. In addition, output per acre of farmland has greatly expanded through the use of fertilizers and pesticides, the production of which requires petroleum and natural gas. In fact, in 1974 the production of fertilizers and pesticides alone accounted for more than 35 percent of all energy used in U.S. agricultural production, and by one estimate, 80 percent of the entire increase in corn yields from 1945 to 1970 is directly attributable to increased use of energy.

Cotton production is no exception. Of the 10 most important crops produced in the United States in 1974 only the production of fresh vegetables required more energy per acre than cotton. A steady westward shift in cotton production the past 150 years has resulted in cotton being produced in States which rely more heavily on energy use. In 1839 the Deep South States of Alabama, Georgia, Louisiana, Mississippi, North Carolina, and South Carolina produced 94 percent of this Nation's cotton (table 1). By 1940 cotton production in those States had fallen to 41 percent of U.S. output. On the other hand, while Arizona, California, Oklahoma, New Mexico, and Texas produced virtually no cotton in the mid-1800's, these States, which rely heavily on irrigation, today produce three-fourths of the Nation's cotton. The increased importance of energy in cotton production gives rise to concern regarding the effects of higher energy prices on cotton producers and on cotton's ability to compete with substitute fibers.

TABLE 1.—COTTON PRODUCTION IN 14 LEADING STATES AS PERCENTAGE OF U.S. TOTAL

	1839	1900	1940	1970	1977
Alabama.....	14.8	10.1	6.2	5.0	1.9
Arizona.....	0	0	1.6	4.6	7.5
Arkansas.....	.7	7.9	11.9	10.3	7.3
California.....	0	0	4.3	11.4	19.5
Georgia.....	20.7	12.4	8.0	2.9	.6
Louisiana.....	19.3	7.0	3.6	5.1	4.6
Mississippi.....	24.5	10.4	9.9	16.1	11.5
Missouri.....	.1	.3	3.1	2.2	1.6
New Mexico.....	0	0	1.0	1.3	1.1
North Carolina.....	6.6	5.0	5.9	1.5	.4
Oklahoma.....	0	3.4	6.4	1.9	3.1
South Carolina.....	7.8	7.7	7.7	2.1	.8
Tennessee.....	3.5	2.2	4.1	3.9	1.8
Texas.....	0	32.9	25.7	31.5	38.3

Sources: U.S. Bureau of the Census, U.S. Department of Agriculture.

ENERGY AND THE DEMAND FOR COTTON: THE NATURAL VERSUS MAN-MADE DEBATE

Natural fibers were used to produce nearly all textile products 50 years ago. Polyester, cotton's most intense competitor, has only been commercially available since 1953. Fiber use in textile mills has more than doubled since 1940. However, cotton's share of total mill fiber use has not kept pace with textile industry growth. Cotton accounted for 81 percent of mill fiber in 1940 (table 2). In the early 1950's the manmade fiber industry developed the "wash and wear" capabilities of an acrylic/cotton blend. Shortly after this revolutionary development, polyester production began, and the manmade fiber industry was well on the road to capturing the increasing needs for textile products. By 1970, cotton's share of mill use had fallen to 40 percent and by 1977 to 26 percent.

TABLE 2.—U.S. MILL CONSUMPTION OF SELECTED FIBERS

(Millions of pounds and percentage of total)

	1940	Percent	1960	Percent	1970	Percent	1977	Percent
Manmade fibers.....	482	10	1,875	29	5,501	57	8,900	73
Cotton.....	3,959	81	4,196	64	3,774	40	3,170	26
Wool.....	408	8	480	7	273	3	134	1
Raw silk.....	60	1	7		2		1	
Totals.....	4,909	100	6,558	100	9,550	100	12,205	100

Source: Manmade fiber fact book, Man-made Fiber Producers Association, Inc., 1978 edition.

With the 1970's came a new problem for the country: The energy crisis. That crisis brought to light an interesting facet of energy as it pertains to the outlook for cotton producers: The question of energy intensiveness of cotton versus manmade fibers. The debate surrounding the energy question was sparked in 1973 by a study published by the National Cotton Council entitled "The Energy Crisis: Can Cotton Help Meet It?" [4]. Using "1967 Census of Manufactures" and Department of Agriculture data, the study estimated the energy required in the form of both raw materials and fuels to produce cotton as well as cellulosic and noncellulosic synthetic fibers. The study calculated that the equivalent of 3.75 kilowatt hours of energy is required to produce one pound of raw cotton fiber while cellulosic and noncellulosic fiber require 23.7 and 17.64 kilowatt hours, respectively. From these calculations, the report heralds cotton as having a tremendous energy advantage over synthetic fibers.

Extending the analysis one step further in the production process, the study calculated energy requirements for weaving and finishing mills in manufacturing cloth from the raw fiber. Processing loss and shrinkage weakened cotton's energy advantage; nonetheless, the study concludes the energy necessary to produce 1 pound of cotton broadwoven cloth is only half that required to produce synthetic cloth. Furthermore, cotton's advantage in knits is greater than in woven fabrics.

The implications of the NCC study are clear: (1) In the interest of energy conservation, policymakers should encourage a return to natural fibers for textile needs. (2) In the marketplace, increases in

petroleum prices will increase prices of synthetic fibers relative to cotton and stimulate the demand for cotton.

In April 1974, the Man-Made Fiber Producer's Association responded with a paper entitled "Energy Requirements for Clothing of Natural and Man-Made Fibers." [2]. This study pointed out that several energy considerations not recognized by the National Cotton Council study were necessary. Specifically, the study maintained that fabric replacement relationships in finished goods production, maintenance requirements, and apparel durability are all necessary considerations. The study maintains manmade fibers have a significant advantage over cotton in all of these areas and that, in fact, any substitution of cotton fiber for manmade fibers would require more energy, not less.

Probably the most comprehensive study in this area of debate can be found in an article entitled "Cotton Versus Polyester," [8] which appeared in the American Scientist last year. The study (hereinafter referred to as the Van Winkle study) attempted to incorporate other energy considerations, such as garment maintenance and durability, by measuring energy use at all stages of textile production and use or, as the article states, "from the cradle to the grave."

The study estimated that producing 1 pound of raw cotton fiber requires 6.1 kilowatt hours which is significantly higher than the National Cotton Council's original estimate of 3.75 kilowatt hours but is comparable to a later revision by the National Cotton Council to 6 kilowatt hours. Using a weighted average based upon industry practices of polyester production, the study found that 21.58 kilowatt hours of energy are necessary to produce 1 pound of polyester raw fiber. Adding energy calculations for nylon and acrylic fiber, the study calculated cotton's energy advantage to be 4.1 to 1, somewhat lower than the National Cotton Council's 4.7 to 1. From this point, Van Winkle proceeded to undertake the "cradle to grave" analysis by comparing energy used to weave and finish the fabric, manufacture, and maintain a 100-percent cotton shirt, a 50/50 polyester-cotton blend shirt, and a 65/35 polyester-cotton blend men's dress shirt.

The study found that when waste, shrinkage, and fabric weight differences were accounted for, the 65/35 polyester-cotton shirt, the more popular blend in the market, required about 25 percent more energy to manufacture than the 100-percent cotton shirt (table 3). Thus, while cotton still has the energy advantage, the margin is considerably lower than calculated in the National Cotton Council study. The study then calculated energy use for three scenarios of shirt maintenance. Under the most energy-intensive scenario, the one considered by the authors to most closely resemble U.S. laundering practices, the 100-percent cotton shirt requires 89.2 kilowatt hours of energy through 50 cycles of washing, drying, and ironing, while the 65/35 blend shirt requires less than half that amount (table 3). Even under an energy- and water-saving scenario the blend shirt's relative advantage in maintenance is nearly identical. The reversal of the energy advantage in the maintenance cycle gives the 65/35 blend shirt a 1.6 to 1 energy advantage over the all-cotton shirt (115.5 kilowatt hours to 72.4 kilo-

watt hours). In making the final consideration, durability, the study estimates the blend shirt to have a wear life 1.5 times greater than the 100 percent cotton shirt and the overall energy use of the cotton shirt to be 88 percent greater than the 65/35 blend shirt.

TABLE 3.—ENERGY REQUIREMENTS TO PRODUCE AND MAINTAIN 1 SHIRT MEASURED IN KILOWATT HOUR OF FOSSIL FUEL EQUIVALENTS

	100 percent cotton	50/50 PE/cotton	65/35 PE/cotton
Fiber production, per shirt:			
Cotton.....	5.0	2.3	1.5
Polyester.....		6.5	8.1
Cloth manufacture, per shirt.....	18.5	20.2	20.2
Shirt manufacture.....	2.8	2.8	2.8
Total.....	26.3	31.8	32.6
Maintenance:			
Scenario 1 (energy-intensive):			
Washing.....	32.2	15.8	15.8
Drying.....	40.8	23.2	18.7
Ironing.....	16.2	5.3	5.3
Total.....	89.2	44.3	39.8
Scenario 2 (energy-intensive):			
Washing.....	14.8	8.4	8.4
Drying.....			
Ironing.....	16.2	5.3	5.3
Total.....	31.0	13.7	13.7
Cumulative energy use (with scenario 1 maintenance).....	115.5	76.1	72.4
Cumulative energy use (with scenario 2 maintenance).....	57.3	45.5	46.3

Source: T. Leo van Winkle et al., "Cotton Versus Polyester," American Scientist 66 (May-June 1978).

The conclusions that can be drawn are, of course, opposite those of the National Cotton Council study: Policymakers should encourage manmade fiber production and ensure adequate supplies of petroleum to this industry; increasing petroleum prices will give polyester a relative advantage over cotton; and any attempt to replace synthetic fibers to any significant degree with cotton would require a significant diversion of cropland from food production to cotton production.

IMPLICATIONS FOR COTTON PRODUCERS

What does this analysis mean to the cotton producer? It seems clear that the basic approach suggested by the manmade fiber producer's association and used in the Van Winkle study is appropriate. That is, to address the question of energy use in textiles it is not sufficient to compare use at the fiber or fabric production level, but rather, one must include in the analysis energy use from fiber production through the life of the final product, i.e., "cradle to grave." However, it is important to note that the Van Winkle study chose for such a comprehensive examination a men's dress shirt and that men's dress shirts comprise only a fraction of fiber use in the textile industry. The entire apparel industry consumes less than half of total fiber consumption (42 percent, see table 4), and only 50 percent of total cotton fiber is used by the apparel industry (table 4 also). Over half

of all domestic fiber production is used in homefurnishings and industrial uses, and 45 percent of total cotton fiber is used in those end-use categories. Twenty percent of cotton used in homefurnishings is used to produce items such as blankets, bedspreads, drapery, and upholstery where laundering considerations are clearly less important. From this, it seems that a more complete analysis would calculate energy use based upon a weighted basket of textile end uses. The particular end use chosen by the Van Winkle study, while certainly providing valuable insight, overstates the importance of energy use in maintenance as it relates to overall textile end use. Were a "weighted" analysis made, the energy advantage of the manmade fibers is likely to diminish.

TABLE 4.—PERCENTAGE OF TOTAL FIBER AND INDIVIDUAL FIBER GROUPS CONSUMED IN END-USE CATEGORIES, 1977¹

	Total fiber	Cotton	Manmade cellulosic	Manmade noncellulosic
Apparel.....	42	50	38	38
Homefurnishings.....	32	27	34	35
Industrial.....	23	16	26	25
Exports.....	4	6	3	2
Total ²	100	100	100	100

¹ Interpretation of these percentages is often difficult. To illustrate the correct interpretation, the 1st line of the table should be read as follows: 42 percent of total fiber use is consumed by the apparel sector; 50 percent of total cotton use is consumed by the apparel sector; 38 percent of both cellulosic and noncellulosic fiber use is consumed by the apparel sector.

² Actual figures may not add to 100 percent due to rounding.

Source: Textile Organon, November 1978.

Considering the apparel market, another drawback with the Van Winkle analysis, one often cited by those associated with the cotton industry, is that factors such as style and tastes are ignored as they relate to the importance of durability. In essence, the idea is that the effective life of a shirt or other apparel may at times be quite different from the length of time necessary for the garment to be worn out. This question is, at best, a subjective one but to the extent that fashion or other factors affect the garment life as perceived by the consumer, durability considerations in the energy-use question declines in importance.

When all consideration is given, it is reasonable to conclude that the National Cotton Council study understated the energy intensiveness of cotton fiber use by ignoring end use, that the Van Winkle study overestimated the energy advantage of manmade fibers by restricting consideration to one end use, and that if appropriate adjustments are made, either of the fiber types may indeed have an energy advantage. However, whatever advantage that could be claimed is likely to be relatively small.

Even if one were to suppose that cotton has an energy advantage, that does not mean cotton producers are insulated from energy problems. One can be assured that manmade fiber producers would attempt to develop energy-saving production techniques in response to cotton's advantage. That industry currently boasts a 36-percent reduction since 1970 in the amount of energy required to produce a pound of fiber.

And while the debate has centered around which fiber can save the Nation energy, the fact is that neither industry consumes a significant share of the Nation's energy. Manmade fiber production consumes only 1 percent of the Nation's energy, and all of agricultural production consumes only 3 percent. Moreover, consumers simply do not buy clothing or other textile products on the basis of how much energy was used in the production process. Rather, choice is made based upon characteristics such as appearance, comfort, and ease of care. By far the single most important factor allowing the dramatic gains in textile use by the manmade fibers was their permanent press and wash and wear characteristics. Ease of care outweighed consumer preference for the "feel" of cotton. Therein lies the key to the ability of cotton to increase its share of the apparel industry. The most important factor in the outlook for cotton from the standpoint of demand is the further development of technology which improves cotton's performance as an "easy-care" fabric. That technology has already brought forth the 100-percent cotton permanent press shirt.

CONSERVING ENERGY ON THE FARM

In the final analysis, energy will have the greatest impact on the cotton producers at the farm level. The crucial issue is not the natural versus synthetic debate. Rather, the cotton producer's interest in energy should focus primarily on energy as an input in the production process. It is the producer who will be forced to adjust to higher energy costs and inadequate supplies, and it is here that the greatest potential for energy conservation exists since conservation techniques developed in other areas of textile production will benefit cotton and manmade fiber producers alike.

Half the energy used to produce cotton is used in fertilizers and irrigation, and another 20 percent is used in pesticide production and application. Any plan for energy conservation must integrate the management of these three inputs. Excessive irrigation increases soil erosion, nutrient loss in plant root zones, and unnecessary water and energy costs. Cotton producers can reduce energy costs through increased monitoring of pumping plant efficiency, adoption of energy and water-efficient irrigation systems such as low-pressure sprinkler systems, and increased attention to irrigation timing and exact water needs of the cotton plant. Research indicates in some instances that cotton producers can cut irrigation costs nearly in half with minimal effect on yields. Minimum tillage reduces trips across the field and energy consumption. Energy use can be reduced through careful monitoring of nutrient needs of the soil and integrated pest management. Research in the Trans-Pecos area of Texas revealed that insect activity was directly related to excessive irrigation and nitrogen fertilization.

Management decisions should pay close attention to the tradeoffs involved in levels of energy input use. If a reduction in irrigation and/or fertilization leads to a reduction in yields and gross income of 20 percent but at the same time a reduction in production costs of, say, 40 percent, it is clearly to the advantage of the producer to accept the lower yields.

In sum, the impact that higher energy costs will have on the cotton producer depends largely on how successfully producers reduce energy use. Energy in the past has been artificially cheap and, therefore, has not been used as efficiently as possible. Tremendous potential for energy conservation does exist, and it is in the light of conservation that the outlook for cotton producers is bright.

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OUTLOOK FOR FRUIT AND TREE NUTS

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GENERAL PRICE OUTLOOK

The 1979-80 season holds promise of plentiful fruit and tree nut supplies for consumers but with moderately lower prices for producers. A record large citrus crop, a near record apple crop, increased supplies of most other noncitrus crops excluding tart cherries and sharply higher prospects for tree nuts will result in lower grower prices for most fruits and tree nuts and reasonable prices at retail. However, good demand in both fresh and processing markets should hold up grower returns and will result in a profitable year for the fruit and tree nut industries.

During the first 9 months of 1979, generally good demand and smaller supplies of many fruits pushed prices received by growers for fresh and processing fruit moderately higher in 1979. The index of prices received by growers for fresh and processing fruit averaged almost 5 percent above the corresponding first 3 quarters a year ago. However, the September index dropped sharply to 217 (1967=100) from 278 in August and was 22 percent below year-earlier level. The sharp decline in the September index primarily reflected larger supplies that lowered prices of peaches and pears, and large supplies of summer fruit dampened citrus prices.

With the seasonal increase in supplies of fresh fruit, fruit prices are likely to continue to decline in the fourth quarter. A record large citrus crop for the 1979-80 season points to the index of prices received by growers for fresh and processing fruit to remain below year-earlier levels at least through midwinter barring severe freezes. However, the 1979 index will still average approximately 4 percent higher than in 1978 reflecting higher prices in the first 3 quarters.

The BLS retail price index for fresh fruit declined in September for the first time in 1979 but was 9.4 percent above a year ago. With the seasonal increase in supplies of fresh fruit, particularly apples and oranges, retail prices have declined. However, inflation and the continued increase in cost of marketing, particularly transportation, may keep retail prices for fresh fruit this fall and winter above a year earlier but the rate of increase will be more moderate than was observed in the first three quarters of 1979. The 1979 retail price index for fresh fruit will still average 10 to 15 percent higher than for 1978.

TABLE 1.—INDEX OF QUARTERLY PRICES RECEIVED BY GROWERS FOR FRESH AND PROCESSED FRUIT

[1967=100]

Year	1st	2d	3d	4th
1975.....	129	152	140	130
1976.....	126	126	130	135
1977.....	142	150	160	200
1978.....	196	227	263	222
1979.....	224	238	256	-----

Source: Agricultural prices, CRB, ESCS.

TABLE 2.—QUARTERLY CONSUMER PRICE INDEXES FOR FRESH FRUIT

Year	1st	2d	3d	4th
1975.....	150	171	177	147
1976.....	146	161	170	166
1977.....	172	190	193	185
1978 ¹	196	223	-----	-----
1978 ²	194	222	247	221
1979.....	218	251	279	-----

¹ From 1975-June 1978, these indexes were entitled Urban Wage Earners and Clerical Workers, BLS discontinued these indexes as of June 1978.² Starting with January 1978 new index entitled All Urban Consumers, replaces previous index.

Source: Bureau of Labor Statistics.

FRESH CITRUS FRUIT

The first forecast of the 1979-80 U.S. citrus crop (except grapefruit in California, other than desert areas) indicates a record 15.2 million tons, almost 15 percent above the 1978-79 crop and slightly above the previous record set in 1976-77. Larger crops are currently expected for all citrus in Florida which accounts for almost 80 percent of total U.S. citrus production in 1979-80. Smaller total U.S. production than in 1978-79 is estimated for grapefruit and lemons.

Oranges

Dominating the citrus scene is a record orange crop. The 1979-80 orange crop is forecast at 11.1 million tons (256 million boxes), 22 percent greater than last season's crop and 5 percent above the record 1976-77 output. Prospects in Florida are for 200 million boxes, also 22 percent above last season. The larger Florida crop is attributed to an increase in yield as most trees have recovered from the freeze damage in January 1977. Prospects in California are set at 49 million boxes, 32 percent more than last season's freeze damaged crop. Estimates are up for both Navels and Valencias by 25 and 40 percent respectively. Prospects of 3.3 million boxes are up 14 percent from last season in Arizona, while Texas production under the impact of last winter's freeze, is estimated to be 4 million boxes, 37 percent smaller than in 1978-79.

TABLE 3.—U.S. CITRUS FRUIT PRODUCTION: 1977-78, 1978-79 AND INDICATED 1979-80

[1,000 tons]

Crop	1977-78	1978-79	1979-80
Oranges.....	9,546	9,156	11,133
Grapefruit ¹	3,030	2,746	2,626
Lemons.....	991	737	695
Limes.....	18	29	44
Tangelos.....	221	189	225
Tangerines.....	228	237	282
Templets.....	221	212	243
Total ¹	14,255	13,306	15,248

¹ Excludes California grapefruit in "other areas."

Opening free onboard prices for Florida oranges were slightly lower than a year ago in a light, early season volume. Orange prices received by growers for the 1979-80 season are expected to average lower than last season's high prices if the current prospects for a record crop materializes. A record orange crop combined with large carryover stocks of frozen concentrated orange juice (FCOJ) in prospect definitely will put downward pressure on orange prices. Current prospects for fresh oranges through the winter point to grower prices declining seasonally to levels substantially below last year's high prices \$6.55 to \$9.69 per box. These lower prices should mean lower retail prices even with the continued increase in costs of marketing.

Exports to Japan will continue to improve as Japan has increased its import quota for U.S. oranges. With record orange production in the United States, our exports of oranges are expected to increase. Imports will be smaller this year in view of the record orange crop.

Grapefruit

Prospects for the 1979-80 season (excluding California's other areas) point to a 63.7 million box grapefruit crop, 1 percent less than last season and 10 percent smaller than the 1977-78 season. The smaller crop is due entirely to a sharp decrease in Texas output as the trees damaged by the freeze last winter did not completely recover.

Florida's grapefruit crop, forecast at 51 million boxes, is up slightly from last season. Arizona growers expect to harvest 2.70 million boxes, 20 percent more than last season. The California desert crop is forecast at 3.50 million boxes, 7 percent above the 1978-79 season. The Texas crop, on the other hand, is expected to be 6.5 million boxes, 28 percent below last season's freeze damaged crop.

During the current season smaller supplies in prospect and good processor demand may result in grapefruit prices near to slightly above 1978-79. Carryover stocks of most processed grapefruit products are down going into the 1979-80 season. Both chilled and frozen concentrated grapefruit have shown good growth patterns in recent years. It is possible exports may weaken. The recent gain in U.S. dollar, against the Japanese Yen could dampen our exports to Japan. The Japanese market is of vital importance to grapefruit trade prospects

and further gains in the dollar against the yen would weaken export prospects still further. Moreover, European sales may be down with relatively large Mediterranean crop in prospect. The record orange crop could moderate what otherwise is upward pressure on grapefruit prices.

Lemons

The Arizona-California lemon crop is forecast at 18.3 million boxes 6 percent below last season's freeze damaged crop and 30 percent less than the 1977-78 crop. The Arizona crop at 3.3 million, is down 40 percent from last year, while California's crop, at 15 million boxes, is 8 percent larger.

With a late developing crop, total movement for this season from August 1 through October 13 was sharply behind last season's pace. Deliveries to both fresh and processing markets have been well behind last year. Shipments to export markets were only half of last season's volume. Reflecting a smaller crop, free onboard prices for fresh lemons opened sharply higher. Prices have declined with increased volume, and averaged \$16.26 per carton through mid-October, compared with \$10.46 a year ago. Prices during the 1979-80 season are expected to average higher than the previous season's high levels.

PROCESSED CITRUS FRUIT

Because of the smaller 1978-79 citrus crop, utilization of the citrus crop for processing decreased to 9.8 million tons, compared with 10.5 million tons during the preceding season. However, processing use still accounted for almost 74 percent of the total crop, the same as the 1977-78 season. More than four-fifths of oranges sold were processed, as were nearly 60 percent of the grapefruit and 38 percent of the lemons.

Florida's 1978-79 pack of FCOJ amounted to 173 million gallons, 7 percent above the previous season. The larger pack was due entirely to the higher juice yield of 1.34 gallons of 45 degree brix concentrate per box, compared with 1.23 gallons the preceding season. The larger pack combined with larger carryover and imports have resulted in total supply of FCOJ during the 1978-79 season substantially larger than the previous season.

Free onboard prices of FCOJ have been steady at \$3.55 to \$3.60 per dozen 6-ounce cans (unadvertised brands, Florida canneries) except when a promotional allowance reduced prices to \$3.25 for the shipments of FCOJ from April 16 through May 18. This compares with \$3.30 a year ago. This promotional allowance resulted in substantial improvement in movement. Movement slackened somewhat after the promotional allowance expired, but it has greatly improved in recent weeks. Consequently, shipments this season through October 13 amounted to 171.5 million gallons, up 10 percent from a year ago. But packers' stocks of FCOJ as of October 13 were still sharply above last season's level. It now appears that the carryover at the end of the season will approach 35 to 40 million gallons, compared with 31.9 million gallons last season. With the record Florida orange crop for 1979-80 in prospect, the FCOJ pack is expected to be substantially larger. Thus, total supplies of FCOJ during the coming season will be large and FCOJ prices are expected to ease somewhat.

In response to good demand. Florida's pack of chilled orange juice for the 1978-79 season reached another record 206.2 million gallons (excluding single-strength reprocessed), 11 percent more than last season. Total domestic movement also set a record of 201.2 million gallons in spite of higher prices. However, the carryover at the end of the season at 15.7 million gallons, was almost the same as a year ago. In view of the record Florida orange crop, another record pack of chilled orange juice is expected. Movement will continue to increase but prices are likely to ease along with FCOJ.

FRESH NONCITRUS

The 1979 noncitrus fruit crop (10 major fruits) is forecast at 12.2 million tons, 4 percent above last year and 8 percent above 1977. Larger crops were estimated for all fruit except apples and tart cherries. Cold storage holdings of most fresh noncitrus at the beginning of October were substantially larger than the comparable period a year ago. Pears, other than Bartletts, were the only fruit in smaller supply. Nevertheless, shipping point prices for most noncitrus fruit are generally higher than a year ago. With the prospective good demand from processors, prices received by growers are expected to be relatively firm although competition from citrus will be keen.

TABLE 4.—U.S. NONCITRUS FRUIT: TOTAL PRODUCTION, 1977, 1978, AND INDICATED 1979

[1,000 tons]

Crop	1977	1978	1979
Apples	3,336	3,817	3,791
Apricots	147	126	145
Cherries, sweet	148	155	192
Cherries, tart	105	91	86
Cranberries	105	123	126
Grapes	4,298	4,567	4,739
Nectarines	155	148	185
Peaches	1,492	1,351	1,462
Pears	787	727	803
Prunes and plums	727	643	664
Total	11,300	11,748	12,193

Source: Crop production, CRB, ESCS.

Apples

The final forecast of the 1979 U.S. commercial apple crop placed production at 7.58 billion pounds, 1 percent below last year's record crop. Prospects in the Eastern States are mixed with New York down 13 percent from 1978 and Pennsylvania up 26, the Central States are down sharply with Michigan 24 percent below last season, and the Western States are up 7 percent with a big crop of 2.3 billion pounds in Washington.

Early shipments of fresh apples were running moderately behind last year's pace because of the late harvest. With a smaller crop, domestic use of apples for fresh market is likely to be below last year's levels, while processing use is expected to exceed 3.3 billion pounds used in 1978-79. The record orange crop may weaken demand for fresh apples, but good processor demand is expected with smaller inventories of canned and frozen apple items.

Opening fee onboard prices for fresh apples at major shipping points were generally moderately to substantially higher than last year, but they have declined with increased volume. Prices are expected to hold relatively firm at levels slightly to moderately above last year despite the downward pressure from an expected large orange crop. Prices will be enhanced by foreign demand. Export prospects to Canada, one of our most important markets, are bright as apple production there is expected to decrease almost 8 percent from 1978. In addition, exports to the Far East and Middle East still look very encouraging.

The smaller crop combined with the expected good demand from the major processors has strengthened the market for processing apples. Apple prices for processing have been agreed to at levels moderately above a year ago.

Cranberries

As of October 1, production of the Nation's cranberry crop was forecast at a record 2.52 million barrels (114,000 metric tons), 3 percent larger than the 1978 crop. Despite the larger crop, season opening prices for fresh Massachusetts cranberries in Chicago wholesale markets were 32 percent higher than a year ago. They are expected to decline as the season progresses. Larger crops are expected for all producing States except Massachusetts. Even with a larger crop, prices for canned cranberry sauce are not expected to decline. There will be good supplies for the holiday season.

Grapes

This season's U.S. grape production is forecast at 4.74 million tons, 4 percent above the 1978 crop. California expects 4.30 million tons, 7 percent more than in 1978, as larger crops of table and raisin varieties more than offset smaller output of wine varieties. Production of wine varieties is forecast at 1.7 million tons, down slightly from last year's record crop.

Total grape production from States other than California is estimated at 438,800 tons, down one-fifth from 1978, reflecting mainly a sharply smaller crop in Washington. New York, the second largest grape-producing State, expects a crop of 170,000 tons, a tenth smaller than 1978. Production in Washington, the third largest grape-producing State, at 95,000 tons, is down almost a half from 1978's large production as a result of extreme cold winter and hot July weather. Michigan's grape crop is also down moderately.

Shipments of table grapes were running substantially above last year's pace through mid-October but have declined seasonally in recent weeks. Demand for fresh grapes so far this season has been good as total unloads through mid-October were 10 percent above last season. Consequently, shipping point prices for California Thompson seedless grapes in early October have strengthened to levels above a year ago. Thompson seedless were selling at \$11.75 per 23-pound lug in Kern County, Calif., compared with \$10 at the same time last year. Fresh grape prices are expected to remain firm as supplies will continue to decline. With production of standard quality raisins increasing to the normal range after the rain-damaged crop of a year earlier, the field prices for California raisin grapes have settled sharply lower than last

year's unusually high levels. Winery prices to growers of good quality grapes in California are generally below last year's levels. Prices vary greatly by producing areas, supplies, and varieties of grapes. With prospects for another increase in inventories coupled with an uncertain economy, wine prices will be under downward pressure. However, demand for wine continues to increase as per capita consumption for all adults was 3.04 gallons in 1978, up 6 percent from 1977. A further increase is expected in 1979.

Pears

Larger available supplies of Bartlett pears have resulted in lower prices for both fresh market and processing use. California growers and canners have agreed on a field price of \$172.50 a ton for No. 1 grade Bartletts, compared with \$182.50 last year. The Washington-Oregon Canning Pear Association and processors agreed on the price for No. 1 grade Bartletts at \$170 per ton, down from \$185 per ton in 1978. In contrast, because of the smaller winter pear crop, opening free on board prices were moderately higher than a year ago. Prices for fresh pears are expected to remain firm this winter. With a slightly smaller fall and winter pear crop in Europe and Canada, export prospects are favorable.

PROCESSED NONCITRUS

Because of a larger noncitrus crop, the 1979-80 pack of most non-citrus fruit is likely to be more than that of a year ago. But total supplies of canned noncitrus fruit are not expected to increase appreciably because of smaller carryover stocks at the beginning of the season. Supplies of most dried fruits are expected to be up, particularly raisins from last year's sharply reduced pack. In contrast, frozen fruit supplies will probably be moderately smaller because of the sharp decrease in freezing tart cherries. Wholesale prices for most processed noncitrus will be firm as a result of higher costs of raw materials and processing.

The 1979-80 pack of most canned noncitrus fruit likely will be larger than last year, reflecting the larger noncitrus crop. Pack data for most canned noncitrus items are not yet available. The volume of Clingstone peaches received by California processors this season totaled 694,254 tons, compared with 607,502 tons last year. Packers' receipts of Bartlett pears this season are expected to be larger than the 227,804 tons received last season because of a larger crop. With larger Clingstone and Bartlett pear crops, the 1979 fruit cocktail pack is expected to be larger than last year. The pack of canned apricots totaled 4.2 million cases (24 No. 2½'s) compared with 3 million cases last season. With smaller carryover stocks of canned apples and applesauce, and the relatively large apple crop in several processing areas, the total pack of canned apple items will be larger. Carryover stocks of canned apple-juice are well above year earlier levels.

In response to smaller supplies, wholesale prices of most canned fruit continued to advance. The September Bureau of Labor Statistics' Wholesale Price Index reached a record high 220.6 (1967 equals 100), almost 10 percent above a year ago. Prices for most canned fruit have been raised, reflecting the higher raw product costs and increased

processing and marketing costs including tinplate, labor, and transportation.

U.S. dried fruit production for the 1979-80 season is expected to total above a year earlier when rain severely dampened the raisin variety grapes. The total raisin tonnage is currently estimated at 283,000 tons, sharply above a year ago. Total dried prune pack, the other major dried fruit item, is placed at 130,000 tons, down slightly from last year.

Because of the sharply larger supplies in prospect, the BLS September wholesale price of raisins declined to \$30.16 (15-ounce package, case of 24) from \$34.50 in August. But it is still sharply above a year ago. Prices are likely to weaken further when larger quantities become available. Wholesale prices of dried prunes have remained steady at \$17.28 (16-ounce package, case of 24) since last February. In view of the supply situation, prices of dried prunes are expected to remain relatively firm throughout the season.

The 1979 U.S. pack of frozen deciduous fruit and berries is expected to be smaller than the 509 million pounds packed in 1978, primarily as a result of the considerably smaller pack of tart cherries. The total pack of frozen cherries was 104.6 million pounds in 1979 down 17 percent from a year earlier, reflecting a sharply smaller crop in Michigan. In contrast, receipts of strawberries delivered to California freezers totaled 129.1 million pounds through early October, compared with 114.7 million a year ago. In addition, imports of frozen strawberries, mainly from Mexico, during the first 8 months of 1979 were also substantially more than the corresponding period a year earlier.

Cold storage holdings of frozen fruits and berries (excluding juices) on September 30 totaled 535 million pounds, 5 percent smaller than a year earlier. Substantial to sharp decreases in volumes of frozen apples, tart cherries, peaches and raspberries more than offset increases in blueberries and strawberries. Despite larger stocks, wholesale prices of frozen strawberries have advanced in the last 3 months. The September BLS wholesale price index of frozen strawberries at 217.9 (1967=100), was 16 percent above year-earlier levels. With the expected smaller supplies wholesale prices for most frozen fruit will remain firm throughout the season.

TREE NUTS

Current prospects for the four major domestic edible tree nuts (almonds, filberts, pecans and walnuts) point to an estimated output of 632,175 tons (in-shell basis), 43 percent larger than 1978. A record almond crop 93 percent above last year's small production is expected and the walnut crop is forecast to be sharply larger than the very small crop in 1978. The pecan crop will be slightly smaller, while filbert production is expected to be sharply smaller. Prices for almonds are not expected to decline appreciably in view of good world demand, and short crops in Spain and Italy, but walnut prices are expected to be below year-earlier levels despite a favorable export market. Prices for pecans will probably be lower because of larger supplies reflecting heavy carryover, but filbert prices will be firm with major producing countries expecting reduced supplies.

PER CAPITA FRUIT CONSUMPTION

Total per capita fruit consumption (fresh and processed) in 1978 reached 212 pounds (fresh weight equivalent), down slightly from 1977. A decrease in citrus consumption more than offset the decrease in noncitrus consumption.

Per capita consumption of all fresh fruit increased from 83.3 to 83.9 pounds between 1977 and 1978, due to the increase in noncitrus fruits except bananas was relatively steady. Despite higher prices, per capita consumption of bananas, the major fresh fruit, increased from 19.5 pounds in 1977 to 20.6 pounds in 1978. This is the highest level since 1952. Per capita consumption of fresh citrus fruit in 1978 was 26.2 pounds, down 0.2 pound from 1977. This is the lowest in the last 10 years.

Per capita consumption of processed fruit declined slightly from 130.4 pounds in 1977 to 128.1 pounds in 1978. This decline was due primarily to the moderate reduction in processed citrus, particularly frozen concentrated orange juice (FCOJ). Because of sharply higher prices, per capita FCOJ consumption declined from 7.65 pounds in 1977 to 6.17 pounds in 1978, the smallest amount since 1972. Per capita consumption of processed noncitrus fruit in 1978 was 46.6 pounds, up 0.9 pound from 1977. This increase was due mainly to the larger volume of canned juice consumed.

Total per capita fruit consumption (fresh and processed) in 1979 is expected to be slightly more than the 212 pounds consumed in 1978. Per capita consumption of all fresh fruit will decrease slightly as the decrease in citrus consumption more than offset the increase in noncitrus consumption. Per capita processed citrus consumption, particularly frozen concentrated orange juice will be up moderately, while that of processed noncitrus fruit consumption is expected to be near last year's level. The 1979 raisin consumption will recover from the low level reached in 1978, but frozen fruit consumption will be down.

Projecting per capita consumption into the 1980's is useful but risky and a number of approaches can be utilized. The authors have used several alternatives to estimate 1983 per capita consumption for fruit. These should not yet be interpreted as official USDA projections.

The first set of 1983 estimates is based on a trend line projection using 1950-78 as a base. Results indicate 1983 fresh per capita consumption declining 16.6 pounds from 1978 and dried 0.6 pound while total fruit consumption is down 8.5 pounds, chilled and frozen 0.50. Frozen per capita consumption would be projected to increase 8.4 pounds over the same period and canned and chilled 0.3 pound.

The second set of estimates are results from a simple demand model which incorporates consumer or wholesale prices of fruit by category, per capita expenditures on nondurables, and per capita consumption of substitute fruits as explanatory variables. The base period was 1950-78 with allowance for the severe Florida freeze of 1963-64. Results indicate per capita consumption of fruits between 1978 and 1983 would increase 8.7 pounds in total, decrease 8.4 pounds on fresh, increase 11.5 for frozen, 2.9 for canned and chilled and 2.7 for dried.

More subjective estimates by Huang-Bohall indicate a growth pattern for total per capita fruit consumption to 1983 reaching 220 pounds

with most of the increase in processing categories particularly frozen and canned and chilled. We expect fresh and dried to remain relatively stable although there are good arguments either way on fresh.

A space is provided for your own estimates and we can check out results in four years.

TABLE 5.—PER CAPITA CONSUMPTION FOR TOTAL, FRESH, FROZEN, CANNED AND CHILLED, AND DRIED FRUIT, 1977, 1978 AND FORECASTS FOR 1979 AND PROJECTION FOR 1983

[Pounds per capita, fresh weight equivalent]

	Total	Fresh	Frozen	Canned and chilled	Dried
1977.....	213.7	83.3	60.0	60.7	9.7
1978.....	212.0	83.9	55.1	64.1	8.9
1979 estimate.....	215.3	83.2	58.0	64.7	9.4
1983 historical trend, 1950-78 ¹	203.5	67.3	63.5	64.4	8.3
1983 simple demand model, 1950-78 base ^{1,2}	220.7	³ 75.5	⁴ 66.6	⁵ 67.0	⁶ 11.6
1983 Ben Huang—Robert Bonall subjective projection.....	220.0	84.0	61.5	65.5	9.0
1983 your estimate.....					

¹ John Yanagida and Roger Conway ran the trend line analysis and developed the simple demand model. We hope to revise this model and publish results as a special article in a forthcoming issue of the Fruit Situation during 1980.

² Per capita consumption of fruit by category equals F.

³ Consumer or wholesale prices of fruit by category.

⁴ Per capita consumer expenditures on nondurables.

⁵ Per capita consumption of substitute fruits.

⁶ Shift variable to adjust for the 1963-64 Florida freeze.

214 OUTLOOK FOR VEGETABLES AND POTATOES [3]

(By Jules V. Powell, agricultural economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

GENERAL PRICE PROSPECTS

Vegetable supplies up, prices ease down

Increased supplies of both fresh and processed vegetables will reduce producer prices for those items this fall and dampen retail prices. Supplies of fresh vegetables for calendar year 1979 will be 3-4 percent larger than last year's total, and about 6-7 percent more vegetables will be processed. Prices to fresh vegetable growers this fall will advance seasonally but will probably remain below year-earlier levels. Retail prices for processed vegetables this fall and winter will reflect substantial increases in marketing costs but because of large supplies will remain near or moderately above the prices consumers paid in 1978.

Prices received by growers for fresh and processed vegetables through the first quarter of 1979 were substantially higher this year than last, but fell below year-earlier levels in May and remained lower through September. Meanwhile, wholesale prices for canned vegetables rose steadily throughout the year, and in August prices were 7 percent above the year earlier level. With supplies of canned vegetables up 6 to 7 percent during the 1979-80 marketing year, prices will probably remain near or moderately above year-earlier levels.

The supply-price picture for frozen vegetables is about the same—supplies will be up during 1979-80, but prices will remain about the same as last year because of higher processing and marketing costs. Increased costs of refrigerated freight particularly will impact on costs of marketing frozen foods.

The retail price index for processed vegetables for the third quarter of 1979 was estimated to be 111.0 (December, 1977=100) up about 5 percent from the same period a year earlier. If current estimates of 1980 supplies are accurate, the index is expected to rise another 5 percent through 1980 as rising processing and marketing costs offset lower raw product prices.

FRESH VEGETABLES

The 1979 supply of fresh vegetables and melons varied among seasons with increased supplies in the winter quarter and smaller supplies in the summer quarter. Supplies during the spring and expected this fall are virtually unchanged from totals of the 2 previous years. The substantially larger winter crop was partially offset by a 9-percent reduction in imports during the January-March period. Smaller supplies in the summer quarter resulted primarily from a reduction in planted acreage.

Vegetable acreage for fall production of 14 major fresh vegetables is expected to be 3 percent less than in 1978. Based on average yields, production of these vegetables is projected at 48.2 million hundredweight, virtually the same as last year's production of 48.3 million hundredweight.

Larger production is expected for snap beans, carrots, celery, sweet corn, eggplant, escarole-endive, green peppers, and spinach. Decreased production is indicated for broccoli, cabbage, cauliflower, cucumbers, lettuce, and tomatoes.

Lower prices in 1979-80

Fresh market vegetable prices to growers during the winter quarter of 1979 were sharply higher than during the same period a year earlier. In April, farm prices dipped below year-earlier levels and, except in August, remained there through September. The index of prices received for fresh market vegetables stood at 174 (1967=100) in September, compared with 183 a year earlier. For the remainder of 1979, prices will rise seasonally, but will probably remain below year-earlier levels during the fourth quarter.

QUARTERLY INDEX OF FARM PRICES FOR FRESH VEGETABLES¹

[1967=100]

Year	1st	2d	3d	4th	Annual
1971-----	125	129	106	144	126
1972-----	134	126	123	133	129
1973-----	160	143	145	126	156
1974-----	143	164	144	159	152
1975-----	168	183	164	177	173
1976-----	184	158	169	182	178
1977-----	251	183	165	188	197
1978-----	202	258	189	189	209
1979-----	273	206	185	-----	-----

¹ Excludes potatoes.

QUARTERLY RETAIL PRICES FOR FRESH VEGETABLES¹

[1967=100]

Year	1st	2d	3d	4th	Annual
1971-----	119	137	120	129	126
1972-----	137	134	128	133	133
1973-----	151	167	153	138	152
1974-----	150	160	152	151	153
1975-----	168	169	165	160	166
1976-----	170	168	165	179	170
1977-----	221	216	178	184	200
1978-----	212	247	209	204	218
1979 ² -----	254	224	NA	-----	-----

¹ Excludes potatoes.

² Consumer Price Index, all urban.

Note: USDA estimate derived from Consumer Price Index.

Retail vegetable prices in 1979 followed grower price patterns, but were somewhat less volatile. Demand for fresh vegetables was strong through the first quarter but weakened in the spring and summer. Demand will remain below year-earlier levels this fall and winter if the general level of economic activity declines, as expected. Certainly a recession would adversely affect the fast food and food service industries which are major contributors to the high level of demand for salad vegetables, particularly lettuce.

PROCESSED VEGETABLES

Larger supplies of processed vegetables

The area contracted for production of seven major processing vegetable crops in 1979 is estimated at 1.5 million acres, 5 percent more than in 1978. The raw tonnage production under contract is expected to approximate 11.3 million tons, about 11 percent more than was produced last year. Production increases are expected for green lima beans, snap beans, beets, green peas, winter spinach, and tomatoes. The largest tonnage increases were contracted for green peas as processors of both canned and frozen green peas attempt to build up stocks of both items. The tonnage of sweet corn and spring spinach will probably be smaller than in 1978.

Preliminary data indicate that the carryover of leading canned vegetables was only slightly larger than last year. Stocks of frozen vegetables on September 30, at 1.9 billion pounds, were 7 percent above year-earlier levels.

Most of the increase in canned tonnage will come from the 9-percent increase in tomato acreage. Supplies of both canned and frozen vegetables will be generous during the 1979-80 marketing year. Reflecting these bountiful supplies, wholesale prices for canned and frozen vegetables will remain near year-earlier levels.

Price increases will result from increases in processing and marketing costs. Some of these costs have risen substantially during the past year. For example, the tinplate cost index (WPI Code 1031-0101) rose 16 percent between May 1978 and May 1979. During the same period, the index of prices for aluminum foil rose 14 percent. Canning workers' wage rates rose 7.7 percent in 1979, and the monthly index of rail rates in August 1979 stood at 228.9 (1967=100) compared with 212.9 a year earlier. On the other hand, the cost of the vegetables in a can—only a small portion of the price consumers pay—declined. The index of prices received by farmers for commercial vegetables (both fresh and processing) averaged 166 (1967=100) for September, slightly below a year earlier.

Much of the gain in processing vegetable tonnage is coming from California tomatoes which do not compete directly with other fresh and processed vegetables. However, there are also larger crops of green lima beans, snap beans, beets, green peas, and winter spinach—items which are often substituted for each other, depending upon relative prices. For example, the large pack of green beans expected this year probably will tend to depress the prices of peas, corn, and other canned items.

The total supply (pack plus carryover) of canned vegetables for 1979-80 will probably be about 5 percent larger than the nearly identical amounts in 1977 and 1978. The larger total supply will result entirely from a 6-percent larger pack since the carryover in 1979 exceeded the 1978 figure by only a few thousand cases.

Wholesale prices for canned vegetables rose steadily during the past year, and in August the index of prices for 10 leading vegetable stood at 191.6 (1967=100), compared with 178.6 a year earlier. With promotional allowances and off-the-line price cuts numerous, it is likely that prices will be about the same as last year. Prices for frozen vegetables will also be near year-earlier levels. Stocks are up, but costs of

processing and marketing will keep prices near last year's level. On September 14, an additional 1.1 percent was added to the then current 2.4 percent surcharge for fuel costs. In addition, a 12-percent increase in mechanical refrigeration charges was granted to rails effective August 28. Under the new rates, costs of shipping a carton of 10-ounce packages of frozen vegetables from Oregon to Chicago move up to 61.2 cents per case—up 1.2 cents, and the cost per 30-pound tin rises to \$1.15—up 2 cents. A general rate increase of 7.4 percent was granted on October 15. With increased built-in costs of processing and marketing frozen vegetables, there will be fewer promotional allowances this year despite plentiful supplies. Stocks of frozen vegetables on October 1 were 1.9 billion pounds, 7 percent more than last year.

PROSPECTS FOR LEADING ITEMS

Peas

The tonnage of peas for canning and freezing this year was substantially larger than last season. The 1979 pack of canned peas was estimated at 29 million cases (24/303's), about 14 percent more than a year earlier.

Lima beans

Lima bean tonnage for canning and freezing is 83,220 tons, only slightly more than last year. Increased contracted tonnage in California accounts for nearly all of the increase. Total supplies of frozen lima beans, at approximately 168 million pounds, are about 9 percent more than during the preceding year. Prices will remain near year-earlier levels.

Snap beans

The estimated tonnage of snap beans for canning and freezing is a sixth larger in 1979 than a year earlier. The carryover of canned green beans, at 6.2 million cases (24/303's), was also larger than during the past 2 years. The 1979 pack is also expected to be up substantially, resulting in heavier supplies in 1979-80. Retail prices will decline from the current level which is higher than a year earlier. Snap beans, along with canned peas and sweet corn, are volume leaders among canned vegetables and are often used as price leaders by retailers.

Sweet corn

Processing volume of 2.3 million tons is 4 percent smaller than last year. Most of the producing States show declines in production; only Idaho, Indiana, and Wisconsin show increases. The increases are forecast for the canning States. The Pacific Northwest States—Washington and Oregon—which do most of the freezing of corn are showing declines.

With another large carryover of canned corn, coupled with the prospect of a larger-than-average pack, supplies will be large this fall and winter. Some price declines and discount pricing can be expected this marketing season. Even if disappearance approaches the record of 58.4 million cases (24/303's) set 2 years ago, next year's carryout will be large and additional reductions in contracted acreage will be indicated.

Tomatoes

Increased acreage and improved yields are responsible for a substantial increase in tomato tonnage in California this year. California is expected to produce about 86 percent of the processing tomatoes. Contracted tonnage in other States declined slightly from year earlier levels. Tonnage was down particularly in California's two major competitors, Indiana and Ohio.

Other processed vegetables

There will be a near-record supply of about 17 million cases of canned beets for the 1979-80 marketing year. Prices will remain firm, however, in response to strong demand for canned beets.

Frozen broccoli stocks on September 1 totaled 97 million pounds, down slightly from the year-earlier level. Continued short supplies of frozen broccoli will edge prices higher this winter. Bountiful supplies of frozen cauliflower, a major substitute for broccoli, may keep prices down. Supplies of frozen cauliflower on September 1 stood at 56 million pounds, 43 percent more than a year earlier. With generally large supplies of all frozen vegetables and the substitutability of one vegetable for another, frozen vegetable prices will remain near year-earlier levels, with lower raw product costs being offset by higher processing and market costs.

POTATOES

Smaller crop this year

The U.S. fall crop production is estimated at 300.3 million hundredweight, 7 percent less than the 1978 crop. This production will come from 1.07 million acres, down 6 percent from a year earlier. Yields in 1979 are expected to average 280 hundredweight per acre, the same as last year, but 10 hundredweight per acre larger than in 1977.

In the seven eastern fall potato States, production at 49.4 million hundredweight is 4 percent above the year-earlier level because yields, particularly in Maine, were up substantially from last year's low levels. The average yield for the Eastern area is placed at 254 hundredweight per acre, compared with 234 hundredweight per acre in 1978. In the eight Central States production is forecast at 63.5 million hundredweight, an 8-percent decrease from 1978.

Production in the Western States, at 188 million hundredweight, is 9 percent below the 209 million hundredweight produced in 1978. Both yields and acres planted are smaller than last year.

Price and supply implications

With a total fall crop 7 percent smaller than last year's record high, grower prices in the fourth quarter will increase and could average in the \$3.35-\$3.55 per hundredweight range. With generally good quality in all areas, grower prices might edge even higher during the first quarter of 1980. Prospects for exports of fresh potatoes to Canada, Western Europe, and Japan are good because crops in those countries are below year-earlier levels. In addition, processors anticipate a continued growth in exports of processed potatoes—particularly frozen french fries—to Japan, where there has been a rapid growth of the Western style, fast food industry. For the October 1-September 1 export year, exports of frozen french fries totaled 22,722 metric tons,

86 percent more than during a similar period a year before. On October 1, stocks of frozen french fries totaled 539 million pounds, 4 percent less than a year earlier. With a smaller crop and bright prospects for exports, prices to potato growers will average higher than during the past 2 years.

Per capita use up

Consumption of potatoes in 1978 increased to 123.9 pounds per person as the continued decline in the consumption of fresh potatoes was more than offset by an increase in the consumption of frozen. In 1978, fresh consumption dipped to 48.8 pounds, down from 54 pounds, while the consumption of frozen potatoes jumped 4 pounds per person to 43.9 pounds. Consumption of chips and dehydrated also increased, but disappearance of canned potatoes remained at the 2 to 2.5 pounds per person level.

SWEET POTATOES

The 1979 sweet potato crop is forecast at 14.8 million hundred-weight, 4 percent larger than the 1978 crop. Production will be harvested from 122,000 acres, 1 percent more than last year. Yields per acre will average 122 hundredweight, compared with 119 hundred-weight a year earlier.

With canners' carryover stocks at record high levels, there is little incentive to pack more and grower prices in the processing market have been down. Canners' stocks totaled 2.2 million cases (24/303) in July 1979 compared with less than 1 million a year earlier.

MUSHROOMS

U.S. mushroom production set another record in 1978-79, moving up 13 percent over a year earlier to 452 million pounds. Pennsylvania, the leading State, grew 214 million pounds, or 47 percent of the U.S. production for the 1978-79 season. Pennsylvania's share of the U.S. total is declining as production in other States has increased in recent years. The U.S. average yield of 3.08 pounds per square foot is 4 percent above the 1977-78 yield and the highest since annual data have been published.

Fresh market sales of mushrooms, at 228 million pounds, were up 19 percent from the 1977-78 season and accounted for 50 percent of the U.S. production. The average price received by growers reached 94.9 cents per pound, an increase of 4.8 cents over the previous season.

Processing use also increased, rising to 224 million pounds, compared with 208 million in 1977-78 and 196 million a year earlier. The average price to growers for processing mushrooms moved down to 64.2 cents per pound in 1978-79 from 65.2 cents per pound in 1977-78 and 66.9 cents a year earlier. This may be an indication that the competitive position of U.S. processors is weakening relative to foreign canners.

Per capita use of all mushrooms advanced to 2.7 pounds per person in 1978-79 (raw equivalent basis), up from 2.5 pounds a year earlier. Thus, the steady upward trend in mushroom consumption continued. Of the total consumption, it is estimated that 1.1 pounds were consumed fresh and 1.6 pounds were processed. Of the processed mushrooms consumed, about 1.1 pounds were processed domestically and about 0.5 pound were imported.

Looking further into the eighties, total and per capita consumption of mushrooms is expected to increase but possibly at a slower rate than during the seventies. Most of the growth is expected in the fresh sector. During the 1979-80 marketing year, prices to growers for fresh mushrooms should average moderately above year-earlier levels. Prices for processing mushrooms may average about the same as this season or slightly lower depending on the import situation and possible trade negotiations with competing countries.

DRY EDIBLE BEANS

The dry bean crop for 1979-80 is estimated at 19.9 million hundredweight, 4 percent larger than in 1978, and one-fifth larger than in 1977. The crop will come from 1.38 million acres—7 percent less than a year earlier—but yields increased to 1,434 pounds per acre, 12 percent more than in 1978.

Less dry beans in Idaho, Kansas, and Minnesota

Average prices received by growers increased between March and July, but declined in August and September as the trade became aware of the larger crop in prospect. However, prices in September averaged \$19.50 per hundredweight, a third above the 1978 low level. In view of the larger crop estimate for October, prices will probably decline from current levels and remain near last year's level of \$16.30 per hundredweight for the fourth quarter.

Exports up

Exports of dry edible beans for the September 1978-June 1979, period were running ahead of the year-earlier pace. Export prospects for 1979-80 are not clear, as no unusual shortages have been noted for the rest of the world at this time. Current crop prospects indicate, however, that the level of exports will have a strong impact on the level of prices for domestic dry beans.

SUMMARY

Forecasting vegetable supplies and prices is, at best, risky. Farmers' decisions to plant vegetables are strongly influenced by current supply-price conditions in the market. On balance, however, we anticipate increasing supplies of most vegetables, melons, potatoes and dry beans in 1979. Increasing consumption of leafy, green and yellow vegetables (particularly lettuce) will offset declines in some of the other vegetables. Melon production will continue an upward trend keeping pace with population growth. Potato production might rebound next year to burdensome levels as potatoes are the best alternative crop for much of the acreage taken out of sugar beet production in the Northwest. Dry edible bean production will reflect our growing exports of all agricultural products.

WORLD OILSEEDS AND PRODUCTS OUTLOOK

(By Alan Holz, Oilseeds and Products Division, Foreign Agricultural Service,
U.S. Department of Agriculture)

The 1979-80 world situation for oilseeds and products is beginning to take shape and from the looks of things now this will be another "barnbuster," in terms of supply increases for meal as well as oil.

Brazil and Argentina have committed about all of their 1979 crop soybean supplies and Brazil has even been importing some oil to satisfy near term domestic demand. This should make additional room for U.S. exports of oilseeds and products until the March-May 1980 period.

With record large U.S. export availabilities of agricultural products, chiefly grains and oilseeds there is concern by some that our capacity to handle the continuing growth in exports will soon reach its limit. Whether or not this is true, it is our assumption that foreign demand potential for oilseeds and products during the 1979-80 season will be unhampered by serious transportation problems.

This season, as usual, we are more certain of supplies than we are of demand. It's a simple fact that the bulk of the changes in the world exportable supplies of oilseeds and products are determined by the weather, policies, and prices in only a half dozen or so countries. However, consumption of these supplies is spread among many countries. For example, U.S. exports of soybeans and products currently move to about 123 countries.

NOTE.—Production data were compiled as of October 22, 1979. Production estimates are calculated from assumed extraction rates applied to that portion of each crop available for crushing and/or export and not actual crushings and therefore, represent potential rather than actual product output. Production for 1979-80 includes the product equivalent of Northern Hemisphere crops harvested in the second half of 1979 combined with estimates of Southern Hemisphere crops to be harvested in the first half of 1980. Production estimates for animal fats, palm and marine products are reported on a calendar year. All meal data are reported in terms of soybean meal equivalent at 44 percent protein. All trade statistics are compiled on a calendar year basis unless specified otherwise.

Where are we and where are we headed?

With galloping inflation and record supply prospects, how cheap is cheap? Right now we have a situation where high interest rates, economic uncertainty, and record large crops are causing consumers to hold back waiting for lower prices. Does this sound a bit like a replay of the fall of 1977? Record increases in oil and meal output were also in prospect, feed profitability ratios were not the best, consequently meal consumption was lagging past trends. As a result, meal prices adjusted downward and meal consumption climbed substantially. Oil prices remained firm in 1977-78 despite the fact that the oil equivalent

of carryout stocks in the major producer-exporter countries rose sharply.

Looking back with 20/20 hindsight, 1977-78 turned out to be a season when we overestimated supplies and understated demand. And that has been our bias in recent years, if we had a bias. I personally don't think that we have a bias, but it is a simple fact that our early forecasts are made on the assumption of most probable yields rather than extremes. But the weather is never normal everywhere at the same time. The result in recent years has been that potential oil and meal production in the foreign sector have fallen short of our early forecasts. Similarly, pockets of unfavorable weather in some of the net importing countries have helped to push U.S. exports beyond our early forecasts. The exception to this scenario was in 1974-75 when U.S. exports fell short of expectations due to a worldwide recession.

It is interesting that if we correlate annual changes in U.S. soybean supplies with changes in disappearance, the free market has over the past decade done its job pretty well. Additional supplies of soybeans do generate demand expansion at some price. Whether or not an oilseed producer should expand or reduce his future plantings will, of course, be dictated by his production costs and prices of alternative crops.

Highlights for 1979-80

World oilseed production at 177.6 million tons—up 17.9 million tons or 11 percent from 1978-79. Production of soybeans at 94.4 million tons to account for 75 percent of the increase.

Record large increase in U.S. oilseed production at 71.4 million tons—12.6 million tons or 21 percent above 1978-79. U.S. soybean output up 9.3 million tons accounts for nearly three-fourths of the gain. U.S. sunflower seed about double at 3.7 million tons.

Gain in foreign oilseed output to 106.2 million tons—up 5.3 million tons—largely reflects expected expansion in Southern Hemisphere oilseed crops to be harvested in March-May 1980 period.

World oil supply, including the oil equivalent of oilseed and oil stocks in the major producer-exporter countries estimated at 62.1 million tons—up 4.4 million tons from 1978-79 and sharply above trend.

U.S. fats and oils supply estimated at 19.6 million tons—2.7 million above 1978-79. The indicated gain in U.S. fats and oils supply accounts for more than three-fifths of the gain in world supplies.

Potential world fats and oils production is estimated at 59.2 million tons—4.1 million above last season's above trend volume. Expansion in soybean oil will account for over one-half of the expected gain.

1979-80 aggregate carryout stocks of oilseeds and oils in terms of oil in the major producer-exporter countries are expected to rise substantially to the highest percentage of apparent usage since 1969-70. However, the United States will hold over 70 percent of those stocks this year compared with only 55 percent in 1969-70.

World disappearance of fats and oils in 1979-80 is expected to expand by nearly 3 million tons—about the same as in recent years and sharply above the long-term trend. The disappearance data may include substantial changes in unreported stocks.

1979-80 world supplies of oilseeds and meals at 101.8 million tons SME—up 11.6 million from 1978-79. The indicated increase in world soybean meal supplies accounts for about 85 percent of the aggregate increase in world supplies of all meals.

Potential world output of high protein meals forecast at 96.5 million tons SME—11.3 million above 1978-79. This compares with increases of 5.5 and 12.3 million tons in 1978-79 and 1977-78, respectively. Expansion in soybean meal will account for more than 85 percent of this season's aggregate gain.

Potential U.S. high protein meal output at 49.2 million tons SME is forecast to rise by 8.1 million tons—sharply above last year's 1.7 million ton gain but substantially less than the record large 10.7 million ton gain achieved in 1977-78.

The 1979-80 potential foreign meal production is forecast at 47.2 million tons SME—up 3.2 million tons. The average gain in foreign meal output during the past two seasons was 2.5 million tons SME.

The superstrong gain in world meal supplies is expected to push 1979-80 carryout stocks of oilseeds and meals in the major exporting countries to a record high volume slightly exceeding 10 million tons SME. This would mean carryout stocks as a percentage of disappearance will rise to the highest level since 1969-70. As with oil, the lion's share of the SME stock accumulation is expected to take place in the United States.

World disappearance of meal in 1979-80 is indicated to slow down some from last year's 9 percent growth rate but continue substantially above the long-term trend.

Prices for both meals and oils are expected to be below their 1978-79 levels reflecting the substantial build up in stocks.

Southern hemisphere soybeans—the pivot in 1979-80 foreign competition

This year we are again forecasting superstrong gains in world oil and meal output—gains that are in part dependent upon good weather in coming months for the oilseed-growing regions of Brazil and Argentina. Our early estimates in recent years have proven optimistic because of dry weather in Brazil as well as less than expected yields in countries such as the Soviet Union and India.

A large share of the expected gains in the foreign sector is as yet uncertain because it includes substantial assumed increases in Southern Hemisphere soybean output to be harvested during March-May 1980. If these crops materialize as expected, they will account for one-third of the gain in aggregate foreign fats and oils output as well as 75 percent of gain in foreign meal output. More importantly, the expected gain in 1980 crop Southern Hemisphere availabilities of soybeans and products for export represent nearly 75 percent of the expected gain in all foreign oil exports and slightly exceeds the estimated gain in aggregate foreign meal exports.

The key question is, will the expected gains in Brazilian and Argentine soybean production actually materialize. And if so, how much of the gain will remain unexported until our 1980-81 marketing season? Historically, in years when these crops are cut by adverse weather, the lion's share is exported before October 1. However, in years when production rises substantially, a substantial portion does not move into consumption until after October 1. Assuming that we get substantial gains in 1980 soybean production in both Brazil and

Argentina, we anticipate that a substantial part of that gain will not move until 1980-81.

Since growing conditions during January are critical for Brazilian soybean yields and yields have been adversely affected both in 1978 and 1979, it is simply not possible to project those yields with any degree of certainty at this point in time. We do know that adverse weather did cut Brazilian soybean output by more than 2 million tons from early expectations in both 1978 and 1979.

Trends and transportation implications

Past trends are becoming less reliable as predictors of future production and trade in the world oilseed and product complex. Recent year's data with forecasts and projected trends are summarized below in million metric tons:

	United States	Foreign	Actual	Trend	Trend deviation
Oil:					
1976-77 production	11.2	36.6	47.8	50.2	-2.4
1977 exports	5.9	11.0	16.9	16.5	+ .4
1977-78 production	14.0	38.7	52.7	51.6	+1.1
1978 exports	7.1	11.3	18.4	17.0	+1.4
1978-79 production	14.5	40.6	55.1	52.9	+2.2
1979 exports	7.3	11.9	19.2	17.6	+1.6
1979-80 production	17.0	42.2	59.2	54.3	+4.9
1980 exports	8.0	12.5	20.5	18.2	+2.3
Meal:					
1976-77 production	28.5	38.9	67.4	74.5	-7.1
1977 exports	17.4	16.2	33.6	33.5	+ .1
1977-78 production	39.1	40.6	79.7	77.3	+2.4
1978 exports	23.2	15.6	38.8	35.0	+3.8
1978-79 production	41.1	44.1	85.2	80.1	+5.1
1979 exports	23.4	17.2	40.6	36.5	+4.1
1979-80 production	49.2	47.3	96.5	82.9	+13.6
1980 exports	25.1	19.4	44.5	37.9	+6.6

Both production and exports have substantially exceeded the projected linear trends. Furthermore, exports have up until this season accounted for a somewhat larger share of world output. The countries accounting for most of the consumption gain are not the same countries that are producing those gains.

This indicates a growing requirement for international transportation facilities. Because of potential delays in shipments, it also means that more storage and handling facilities may be needed in some of the importing countries to maintain a smooth and uninterrupted flow of products to consumers.

Whether or not the forecast gains in 1980 world trade for oilseeds and products can be achieved will depend on the adequacy and operational efficiency of the transportation system. However, if a transportation squeeze does materialize, it may be felt more on high bulk, low unit value materials rather than oilseeds and products.

Current 1979-80 forecasts of oil and meal production include the following key crop estimates:

U.S. crop soybean production in 1979 at 60.2 million tons—October estimate—up 9.3 million tons or 18 percent from the 1978 volume.

U.S. 1979 sunflowerseed production estimated at 3.7 million tons—about double last year's volume.

U.S. 1979 crop cottonseed production indicated at 5.1 million tons—up about 1.3 million tons or one-third above the 1978 volume.

Canadian rapeseed production in 1979 is now estimated at 3.5 million tons—about unchanged from the 1978 harvest despite larger plantings.

India's 1979 peanut crop is now estimated at 5.7 million tons, inshell basis, compared with the 6.4 million ton upward revised estimate for 1978.

Senegal's 1979 peanut crop is believed to be about 1.2 million tons compared with 1.1 million tons in 1978.

Soviet's 1979 sunflowerseed production is believed to be in the magnitude of 5.3 million tons or about unchanged from last year's reduced harvest.

Brazil's 1980 soybean crop harvest is forecast at 13.5 million tons—up 2.5 million above the drought affected 1979 volume.

Argentina's 1980 crop soybean production should be at least 4.5 million tons—up 700,000 tons from the 1979 estimate.

Peninsular Malaysia's calendar year 1980 palm oil production is forecast at a record large 2.15 million tons—up 250,000 tons or 13 percent from the 1979 estimate.

In calendar 1980, Philippine copra output is forecast to recover to 2.5 million tons—up about one-sixth or 360,000 tons above the reduced 1979 estimate.

World pressed olive oil output in 1979–80 is estimated at 1.6 million tons—about unchanged from the 1978–79 level.

Aggregate animal fat output in calendar 1980 is expected to gain only slightly from the below trend 1979 volume of 14.7 million tons.

Peru's calendar 1980 fishmeal and oil output is forecast to continue—about unchanged from the estimated 1979 levels of 700,000 tons and 130,000 tons, respectively.

Trade shifts for soybeans and meal

The decade ending last year was marked by a number of key shifts in the relative importance of the major origins and destinations of soybeans and meal traded in world markets. Calendar year trade statistics for soybeans and meal in terms of meal equivalent were as follows:

	1968		1973		1978	
	Tons (millions)	Percent	Tons (millions)	Percent	Tons (millions)	Percent
Exports:						
United States.....	9.07	92	14.93	82	23.37	74
Brazil.....	.29	3	3.00	17	5.94	19
Argentina.....	0	0	.05	0	1.89	6
Other.....	.44	5	.16	1	.20	1
Total.....	9.85	100	18.14	100	30.40	100
Imports:						
European Community.....	4.86	49	8.14	45	13.88	46
Other West Europe.....	1.09	11	1.59	9	3.20	11
East Europe.....	.65	7	2.77	15	3.64	12
U.S.S.R.....	0	0	.56	3	.60	2
Japan.....	2.00	20	3.20	18	3.76	12
Taiwan.....	.34	3	.52	3	.78	3
Other.....	.91	10	1.36	7	4.54	15
Total.....	9.85	100	18.14	100	30.40	100

The above data indicate that:

The compound annual growth rate in world exports of soybeans and

meal at 10.9 percent, during the 1973-78 period was somewhat less than the 13 percent annual growth of the 1968-73 period.

Accelerated growth in exports from Brazil and Argentina has reduced the U.S. share of world trade.

Absolute growth in both U.S. and world trade, during the 1973-78 period accelerated from that during the 1968-73 period.

Traditional markets for soybeans and meal continued to grow throughout the decade, but this growth was overshadowed by growth in movements to newer markets in East Europe, Mexico, and the Republic of Korea.

Given the rising trend in foreign exports of soybeans and meal, future growth in U.S. exports will require that we maintain our competitive position in traditional markets, as well as strengthen our efforts to expand new markets.

Growth in foreign animal product output slowing

Based on our economists' projections of changes in pork and poultry product output in selected major markets, the following changes in protein meal requirements would likely take place, given no change in feeding rates (shown in percent change from previous year) :

	1977	1978	1979	1980
Japan.....	+9.9	+10.9	+7.3	+5.0
European Community.....	+3.7	+4.0	+3.7	0
Other West Europe.....	+7.5	+4.2	+4.1	+3.9
Eastern Europe.....	+5.8	+5.8	0	+1.2
Soviet Union.....	+16.6	+7.5	+5.3	+6.4
Total (weighted).....	+7.5	+5.6	+3.6	+2.3

However, meal feeding rates per animal unit in 1980 will likely be increased to reflect superabundant availabilities at somewhat lower prices.

The soybean meal/corn price ratio as of October 23, 1979, in the European Community (EC) at 0.92 to 1 was slightly less than a year earlier. In Europe outside the EC, the meal/corn price ratio at 1.64 to 1 was significantly below the 2.06 to 1 ratio of a year earlier. The total digestible nutrient value of 44 percent soybean meal is about 1.65 times the price of corn. Soybean meal consumption growth becomes very sensitive to price changes below this ratio.

Historically, there have been a number of years when the meal/grain price ratio was more instrumental in changing meal consumption than changes in animal numbers or livestock product output. And 1979-80 could be another one of those years.

According to our dairy specialists, the dried-milk powder situation has changed significantly with stocks and production down from a year ago.

The latest available data on production and stocks are as follows in 1,000 metric tons with comparisons :

	Stocks on July 31			Production January-June	
	1977	1978	1979	1978	1979
European Community.....	1,074	896	448	1,171	1,134
Other.....	376	334	265	396	376
World ¹	1,450	1,230	713	1,567	1,510

¹ Includes 16 major producing countries.

As of October 23, EC stocks of dried-milk powder had reportedly dropped to only 300,000 tons of which 100,000 had already been committed. In view of the reduced supplies, feed usage of dried-milk powder in the EC is expected to be nil except for calf feed 1979-80. And this should work to strengthen usage of oil seed meals.

Prices for tapioca pellets have been declining in recent weeks as exports from Thailand recover. To the extent that export availabilities of tapioca pellets improve, it would likely result in 1979-80 usage in the EC about unchanged from the 1978-79 volume.

If the EC usage of this protein deficit high carbohydrate feed ingredient does not decline as previously expected, it means that oilseed meal usage in the EC must continue large in order to balance rations using this ingredient.

Foreign protein demand growth will continue

In response to our most recent survey, the U.S. agricultural attachés in 14 major markets registered their assessment of 1979-80 import requirements for soybeans and meal based on current price assumptions. The countries include the EC countries less Ireland, as well as Spain, Poland, Yugoslavia, Japan, Taiwan, Republic of Korea, and Mexico. Projections for the 14 countries show combined imports of soybeans and meal at 27.8 million metric tons, soybean meal equivalent (SME)—up 1.3 million tons or 5.2 percent above the estimated 1978-79 volume. In 1978-79, SME imports into the same 14 countries gained by an estimated 2.6 million tons or 11 percent above the 1977-78 volume. Combined imports of soybeans and meal into these countries, during the 1965-78 period, trended upward by about 1.2 million tons SME per year.

A year ago, a survey of the same 14 countries indicated 1978-79 imports at 24.9 million tons SME. However, actual imports into these 14 countries, at 26.4 million tons, exceeded the forecast by about 6 percent. Similarly, in 1977-78 actual imports into the same selected markets turned out one-sixth above the early forecast.

Beyond the 14 countries just discussed, there is yet one other country that should be mentioned and that is the Soviet Union. I will attempt to highlight the Soviet situation with aggregate supply-demand estimates in million metric tons as follows:

	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Estimated total meal production.....	5.14	4.67	4.55	4.86	4.71	4.74
Imports:						
Soybean (meal basis).....	.28	1.41	1.08	.60	1.40	1.67
Other oilseeds and meals.....	.10	.02	.14	.15	.14	.14
Total.....	.38	1.43	1.22	.75	1.54	1.81
Apparent meal supply ¹	5.52	6.10	5.77	5.61	6.25	6.55
Aggregate seed and meal exports.....	.07	.06	.05	.05	.05	.05
Apparent meal availability.....	5.45	6.04	5.73	5.56	6.20	(²)
Estimated meal consumption ³	5.27	5.84	5.80	5.90	6.20	6.50
Estimated change in stocks.....	+ .18	+ .20	- .07	- .34	0	0

¹ Meal production calculated from assumed extraction rates applied to that portion of each crop available for crushing and/or export and not actual crushings. Includes sunflowerseed, cottonseed, soybean, flaxseed, peanut and fish meals. Data presented in SME at 44 percent protein.

² Not available.

³ Estimated on the basis of calculated high protein feeding requirements and trend.

Please note that a year ago we indicated 1979 Soviet protein import requirements at 1.1 million tons SME—300,000 tons below the current estimate. The above data were largely derived from various assumptions since the Soviets won't publish their 1979 crop harvest estimates until early next year nor do they reveal their meal production by category or meal utilization by class of livestock. However, we can verify the following trade statistics on soybeans as such:

Calendar year	Soybean exports to U.S.S.R.			Reported soybean imports by U.S.S.R.
	From United States	From Brazil	Total	
1975	0	438	438	348
1976	571	1,162	1,733	1,769
1977	565	552	1,117	1,364
1978	745	32	777	873
1979 ¹	1,178	68	1,246	(²)

¹ January–August.

² Not available.

In 1979–80, it appears that Soviet protein availabilities from their 1979 oilseed harvests may be about unchanged from last year, but animal numbers are up—particularly poultry. Given the indicated expansion in protein requirements, increased quantities of some protein ingredient must be imported to maintain meal feeding rates in 1980. Furthermore, Soviet meal feeding rates are extremely low by Western standards and the Soviets are continuing to expand mixed feed output.

Over the long term, the Soviets plan to expand their soybean plantings and sunflower yields. But the soybean expansion will likely be on irrigated land in the western part of the country and would come at the expense of other crops. The potential for improving sunflower seed yields could brighten if the Soviets succeed in switching from open pollinated to hybrid varieties, but that will take time.

In the meantime, if animal numbers continue to grow, meal demand should expand by some function of mixed feed output. Although synthetic protein feed production facilities may be expanded, the cost of such ingredients is more expensive than vegetable protein meals. Yet we know politics as well as economics could influence our future trade with the U.S.S.R., and certainly international trade must be a two-way street.

Lower real prices for soybeans and meal abroad

The fact that feed profitability ratios are less favorable than in 1978–79 would signal reduced growth in meal consumption. However, aside from the fact that meal is now less expensive relative to grain both inside and outside the European Community, there has been a significant decline in the value of the U.S. dollar in relation to major foreign market currencies, as well as gold. This means that real prices

to foreign consumers of soybeans and meal are significantly below those of last year. Comparison data are as follows:

Year beginning Oct. 1	Current dollar European prices (per metric ton)		Index of West German Deutsche marks per U.S. dollar, 1971-72=100	Deflated dollars European prices	
	Soy bean ¹	Soy meal ¹		Soybean	Soy meal
1971-72	133	114	100.0	133	114
1972-73	267	282	88.4	236	249
1973-74	262	194	81.0	212	157
1974-75	252	163	76.2	192	124
1975-76	215	184	80.1	172	147
1976-77	288	238	73.9	213	176
1977-78	256	204	67.9	174	139
1978-79	296	238	58.1	172	138

¹ U.S. origin, c.i.f. Rotterdam.

Thus, in terms of U.S. dollars deflated by this key European currency, we see that the real price for soybeans and meal in 1978-79 did not increase, but actually registered a slight decline.

What happened to the value of the U.S. dollar in relation to our key market currencies no doubt has helped U.S. exports in recent years. The key question is where do we go from here? I'm sorry, but I don't have the answer. And you probably wouldn't believe me if I did.

More coconut oil on the way in 1980

Despite reduced exports of copra and coconut oil from the Philippines during the January-September 1979 period, coconut oil prices in recent weeks have been relaxing from very high premium over other oils. Part of the price weakness reflects the fact that we are now in that season of the year when coconut oil exports normally show some improvement. Moreover, coconut tree numbers have been expanding for a number of years, and this should bring some increase in output next year.

Extrapolation of past rainfall patterns would mean that a significant recovery in Philippine output could take place next year. The fact that Philippine exports of copra meal have not dipped as much as oil exports would indicate that copra production during the January-September 1979 period was somewhat higher than the oil equivalent of copra and coconut oil exports. This would mean that either their consumption of coconut oil has increased sharply, which we doubt, or that there has been some accumulation of coconut oil stocks in the Philippines.

The high coconut oil prices of earlier months were due in part to the fact that Indonesia, formerly a major producer-exporter of coconut oil, became a substantial importer. However, this situation has now changed, since the high coconut oil prices caused the Indonesian Government to encourage consumers to switch from coconut oil to palm oil, which is in abundant supply within the country. Not only should this policy help free up more coconut oil for the rather inelastic U.S. market, but it would also tend to reduce the amount of Indonesian palm oil moving into export.

Slower growth for palm oil in 1980

Despite a relatively steady climb in peninsular Malaysia's oil palm area, the quarterly pattern of production and trade has been irregular. Following below trend growth during the October 1977-June 1978 period, output rose sharply through June 1979. Export growth has also been steep so far this year, with movements of processed oil accounting for all of the gain. Through June, India continued to be the major market for Malaysian palm oil. There have been reports of significant sales to the Soviet Union, and large movements of Malaysian oil indicated to Singapore.

In 1980, despite a sharp pickup in the estimated bearing tree area, the average yield may dip slightly, causing some slowdown in output growth. Assuming no significant change in stocks, export growth would be expected to follow a similar slowing growth trend next year. All of the expansion in exports will likely move as processed rather than crude oil.

Peninsular Malaysia's quarterly production and trade are as follows, in 1,000 metric tons, with comparisons:

	Actual (thousand metric tons)	Change from a year earlier (percent)	Actual (thousand metric tons)	Change from a year earlier (percent)
1977:				
January to March.....	348	+23	276	-7
April to June.....	397	+34	337	+20
July to September.....	386	+18	308	+2
October to December.....	352	+1	383	+18
1978:				
January to March.....	260	-25	283	+3
April to June.....	354	-11	287	-15
July to September.....	504	+31	397	+29
October to December.....	520	+48	388	+1
1979:				
January to March.....	440	+69	410	+45
April to June.....	443	+25	450	+57

In the early 1980's, world palm oil production and export growth will likely continue to expand significantly as a proportion of world fats and oils production and trade. However, future increases in petroleum prices will boost production costs for synthetic rubber which would improve producer returns from natural rubber plantations and ultimately result in expanded plantings at the expense of oil palm. Nevertheless, world palm oil output is expected to approximate 6 million tons by the mid-1980's. The bulk of the gain in output will likely move into exports.

More vegetable oil to India

India, a major producer of oilseeds and products, in recent years has emerged as the major importer of oils and fats. This reflects the fact that the population growth has slightly outpaced domestic fats and oils production thereby limiting per capita availabilities to less than 7 kilos per year. Increased availabilities of foreign exchange allowed India's purchases of imported oils and fats to climb to nearly 1.3 million tons in 1977-78 compared with 1.1 million in 1976-77 and only 240,000 tons in 1976-77. The increase is based on official export statistics of reporting trade partners in calendar years of the latter year of the split year indicated.

India's supply and distribution of oils and fats is estimated as follows, in 1,000 metric tons:

Year	Oil production		Oil imports		Exports	Estimated consumption availabilities
	Peanut	Other	Soybean	Other		
1975-76.....	1,625	1,864	143	99	124	3,607
1976-77.....	1,267	1,653	440	681	21	4,020
1977-78.....	1,460	1,774	474	794	25	4,477
1978-79.....	1,528	1,998	350	650	25	4,501
1979-80.....	1,372	1,993	540	745	25	4,625

The 1978-79 significant expansion in domestic fats and oils production and stock depletion caused import requirements to drop to an estimated 1 million tons.

In 1978-80 India's fats and oils imports are forecast to expand significantly reflecting an estimated reduction in the 1979-80 peanut crop.

The current 1979-80 Indian peanut crop estimate is still very tentative. Rainfall distribution was less than favorable and some further change in the production estimate is possible. Every 100,000 tons of decline in peanut production would boost India's vegetable oil import requirements by roughly 25,000 tons.

The Soviet Union now a net importer of oils

Despite the fact that the Soviet Union continues to export significant quantities of vegetable oils, chiefly sunflowerseed oil, that country shifted to a net import position for vegetable oils in 1979. Despite some expected recovery in Soviet oil production in 1979-80, we expect imports of oilseeds and oils to rise by more than a tenth from last season's estimated volume of 500,000 tons. The data are as follows in million metric tons:

Year	Estimated oil production	Imports	Exports	Apparent consumption availability	Consumption trend
1969-70.....	5.0	0.1	0.6	4.5	4.6
1974-75.....	5.9	.2	.6	5.4	5.2
1977-78.....	5.6	.3	.4	5.5	5.5
1978-79.....	5.4	.5	.3	5.6	5.7
1979-80.....	5.5	.6	.3	5.8	5.8

In 1979-80 over 300,000 tons of the Soviet Union's oil import requirements are expected to be taken in the form of soybeans.

What's new in the PRC?

The People's Republic of China (PRC) significantly increased prices for 18 farm products back in March. Recent reports indicate that the increase for oilseeds at 25 percent exceeds the 20 percent increase announced for grain and cotton. This would indicate that the Chinese are trying to stimulate production of technical crops, but the increase may not be big enough to swing much more land into oilseed production.

During the past year the PRC has been highlighted in the news. We still lack a lot of basic data for this huge country, but we have revised our population series as well as our production series for several

commodities. The data are based on U.S. agricultural attaché reports and USDA research, weather data, composite value judgments concerning oil extraction rates and the proportion of various oilseed crops available for crushing and/or export.

Using this approach, we conclude that there have been no substantial gains in the PRC's production of oils and fats since 1964-65. Our revised estimates are as follows:

Year	Estimated fats and oil production (million metric tons)	Population (millions)	Per capita production (kilos per person)
1964-65	2.16	710	3.0
1969-70	2.16	772	2.8
1974-75	2.88	839	3.4
1975-76	2.97	852	3.5
1976-77	2.79	866	3.2
1977-78	2.66	880	3.0
1978-79	3.06	894	3.4
1979-80	3.14	908	3.5

Because of the low level of per capita oil output in the PRC, exports have been chiefly limited to small quantities of edible soybeans and peanuts. However, the PRC's imports, largely soybeans and oil, have been growing in recent years. Exports of soybeans and soybean oil from the United States and Brazil to the PRC are as follows in 1,000 metric tons:

Calendar year	Soybeans from—		Soybean oil from—	
	United States	Brazil	United States	Brazil
1975	0	32	0	10
1976	0	25	0	6
1977	47	309	62	75
1978	57	19	44	53
1979 (January-August)	85	43	59	65

Despite large domestic production, the People's Republic of China has been a net importer of oilseeds and oils. Unless domestic oil output can be expanded, the People's Republic of China's imports of oilseeds and oil will likely continue and possibly expand depending upon availability of foreign exchange and the priority of other imports.

Shifts in international financial reserves

There has been substantial growth and redistribution in international reserve holdings since 1970. Although imports have grown sharply in recent years, the number of months of imports covered by international reserves has recovered to the record highs that existed before the OPEC petroleum price rise. Furthermore, if we add in the value of gold at current prices then, the value of total holdings by the developing countries is greatly improved.

All this points to the fact that there are many new rich countries that will be growing customers for U.S. agricultural products. Although certain countries may encounter debt servicing problems because of higher interest costs, the ability of most developing countries to meet their debt payments in 1980 seems secure, even if export earnings should slow down.

Things to watch for in 1979-80

Possible changes in growing conditions that could impact on the upcoming soybean harvest in Brazil, as was the case in 1978 and 1979.

Fluctuations in and the general trend of the value of the U.S. dollar compared with key foreign currencies.

Reports of purchases of soybeans as well as products by the U.S.S.R.

The volume of soybean oil exports moving to key countries such as India and the People's Republic of China.

Possible slowdown in Malaysian palm oil expansion which could result in less of a gain in palm oil exports in 1980.

A likely recovery in Philippine exports of copra and coconut oil which could mean these products will become somewhat cheaper relative to other oils.

Indications of possible policy changes in the European community which could impact on U.S. exports of soybeans and meal to that market. Stocks of dried milk powder are down and feed usage will be down in 1979-80. Butter stocks in the European community are being reduced by increased export sales at bargain prices. A substantial volume has already been sold to the Soviet Union.

Continued expansion in oilseed crushing capacity in the importing countries as well as increased availabilities for crushing in Brazil, that could skew the future growth in U.S. exports more toward oilseeds rather than products.

Probable further upward adjustment in petroleum prices by the "OPEC" countries.

Expected gains in vegetable oil demand in the major "new rich" petroleum exporting countries.

Probable substantial decline in U.S. oilseed yields in 1980 following this season's above-trend levels unless the subsoil moisture is replenished before next summer.

Likely above normal U.S. exports in the latter months of the 1979-80 marketing year in anticipation of a possible longshoremen's strike in the fall of 1980.

A heavy carryover of unexported foreign production in Brazil and Argentina on October 1, 1980, which could curb U.S. export growth in 1980-81.

Oil prices relatively stronger than meal prices, at least until the Southern Hemisphere crops are harvested. With normal weather in Brazil, U.S. oil stocks would likely rebuild later in the season as currently expected.

U.S. exports in October-March 1979-80 helped by the fact that Southern Hemisphere 1979 crop soybean supplies are now about all used or committed.

Meal prices will be cheap in relation to corn. However, the high European community grain support prices have in effect tempered world meal prices.

Given current price relationships, U.S. farmers planting intentions to be reported in January would likely show a significant reduction in soybean plantings.

U.S. OILSEEDS OUTLOOK

(By George W. Kromer, agricultural economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

The 1980 outlook for U.S. oilseeds is highlighted by the record large supplies produced from this fall's harvest. Both domestic and overseas demand will continue to expand, but not nearly as much as production. This points to a sharp buildup in carryover stocks, with farm prices averaging slightly lower than last season. Prices next spring and summer will be influenced by the prospects for 1980 oilseed crops, as well as international developments.

U.S. PRODUCTION UP A FIFTH

U.S. production in the five major oilseed crops in 1970-80 is estimated at a record 71 million metric tons, about a fifth above last season due to the larger area planted and higher yields. Oilseed farmers harvested 37 million hectares (91 million acres) this fall, about 13 percent more than in 1978. The U.S. average oilseed yield per hectare is estimated at 2 metric tons or 7 percent above last year's level.

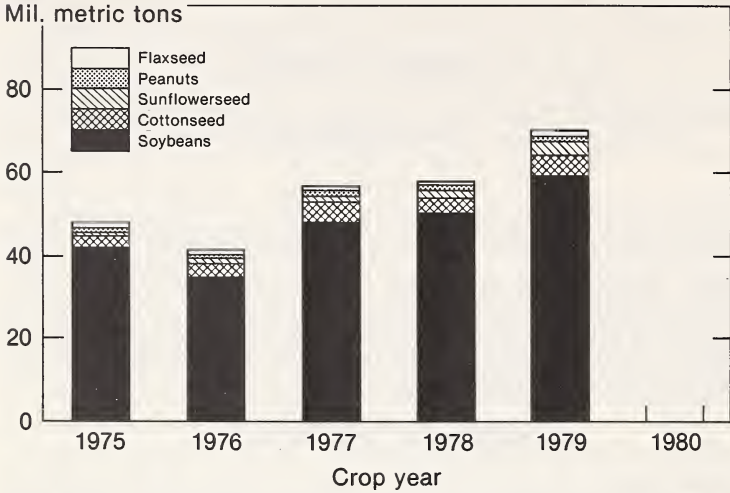
Soybeans make up 85 percent of the total oilseed output for 1979-80 about three-fourths of the 12½ million ton increase expected. Sunflower seed and cottonseed production is also up sharply this season, while flaxseed and peanuts are showing much smaller gains from 1978.

World oilseed production—now projected at 178 million metric tons or 12 percent above 1978-79—also will be record high in 1979-80, primarily due to sharp increases in soybean and sunflower production. This outlook is still tentative since the Southern Hemisphere crops are just now being planted. Some increase in world stocks appears likely since demand growth probably will slow in 1979-80, largely reflecting reduced economic activity and slower expansion in livestock production.

A DECADE OF RAPID GROWTH

During the 1970's, U.S. oilseed production showed a strong upward trend—perhaps the greatest in the agricultural sector—with output doubling during the decade. Oilseed output totaled about 37 million metric tons at the start of the decade but by 1979 had climbed to more than 71 million tons. Area harvested increased to 37 million hectares—a gain of about 58 percent.

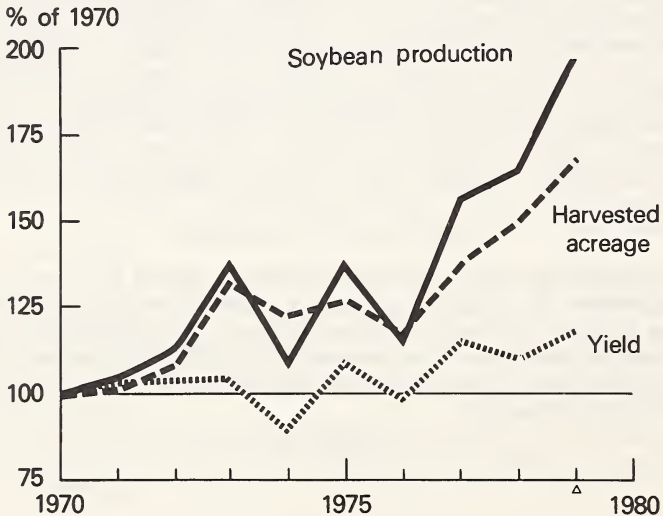
U.S. Oilseed Production



USDA

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INCREASED ACREAGE BOOSTS PRODUCTION



U.S. OILSEEDS AREA AND PRODUCTION IN THE 1970'S

Oilseed	Area harvested (million hectares)				Production (million metric tons)			
	1970	1979	Change		1970	1979	Change	
			Area	Percent			Production	Percent
Soybean.....	17.0	28.4	11.4	67	30.7	60.2	29.5	96
Cottonseed.....	4.5	5.3	.8	18	3.7	5.1	1.4	38
Sunflower.....	(1)	2.2	2.2	NA	(1)	3.7	3.7	NA
Peanut.....	.6	.6	0	-----	1.4	1.9	.5	37
Flaxseed.....	1.2	.4	-.8	-65	.8	.3	-.5	-56
Total.....	23.3	36.9	13.6	58	36.6	71.2	34.6	95

¹ Less than 50,000 ha and 50,000 tons.

Soybean production provided the big boost in oilseed output, accounting for 85 percent of the nearly 35 million ton gain. Sunflower seed was produced on a relatively small scale in the early 1970's, but since 1974 production has skyrocketed by more than 1,300 percent. Peanut area harvested changed little during the decade (due to acreage controls) but production rose about 37 percent, reflecting increased yields. Cottonseed production (a byproduct of cotton fiber) rose 38 percent during the decade. Flaxseed was the only oilseed to decline in importance, as output dropped 56 percent due to reduced demand for linseed oil.

Many factors contributed to the sharp boost in soybean output during the 1970's but perhaps the most important is that soybeans were always competitively priced as market demand showed steady growth and soybean stocks remained low relative to usage. In addition, soybeans provided favorable returns to growers and were widely used in crop rotation with corn.

The 1980's promise to be a period of continued growth in the oilseed sector—particularly for soybeans and sunflower seed. World demand for high-protein meal and vegetable oils will continue to increase—particularly in the less developed countries where per capita use is low. Most of the expanded requirements will be provided by U.S. oilseeds and products.

1980 ACREAGE MAY DECLINE

Soybean acreage in 1980 probably will decline slightly from the 71.5 million acres (28.9 million hectares) planted this year if soybean prices remain unfavorable relative to feed grains. The soybean/corn price ratio in late October was 2.4 to 1 and the March 1980 ratio (based on Chicago futures prices) showed the same price relationship. A soybean/corn price ratio of 2½ to 1 is generally considered favorable for soybeans. Last March when farmers were planning to expand 1979 soybean acreage a tenth, the price ratio was 3 to 1.

Farmers will be faced with higher production costs next spring when planting decisions are made. Cost increases are in prospect for agricultural chemicals, seed, fertilizer, fuel and energy, farm labor, real property taxes, and interest. The U.S. index of prices paid by farmers for all production goods and services in calendar 1980 is projected at a tenth higher than in 1979.

RECORD 1979 SOYBEAN CROP BRINGS LOWER PRICES

With record supplies and a prospective sharp buildup in carryover stocks, soybean prices to producers in 1979-80 are estimated to average around \$6.25 per bushel compared with last season's average of \$6.75. Soybean prices likely will remain under pressure this fall due to the record harvest, as well as transportation problems. This has resulted in a wider-than-normal price spread between farm and central markets. Some seasonal price rise is expected from this fall's low into next spring, depending partly on South American crops.

The 1979 soybean crop is placed at a record 2.21 billion bushels (60.2 million metric tons), 18 percent larger than the 1978 crop. Both acreage (70 million acres harvested) and yield (31.5 bushels per acre) are at new highs, up 11 percent and 7 percent, respectively.

Demand for soybeans and products will continue strong in 1979-80, since American farmers are the only major producers with large quantities to sell until next spring when South American crops enter world markets. Record U.S. supplies of 2.4 billion bushels (65 million metric tons) and lower prices are expected to boost total soybean use to around 2 billion bushels (55 million tons), 8 percent above last season. Consequently, soybean carryover stocks on September 1, 1980, may rise to around 0.4 billion bushels (10 million tons), more than double the 173 million bushels (5 million tons) on September 1, 1979.

Soybean crushings are expected to total around 1.1 billion bushels (30 million tons), compared with the 1.02 billion processed in 1978-79. This rise mainly reflects the prospective increase in soybean meal feeding because of slightly lower meal prices and larger hog and poultry production. Pork supplies will be heavy during the rest of 1979 and through the summer of 1980. Broiler output is up about a tenth this fall but likely will decline in the second half of the marketing year due to much less favorable feed-price ratios.

A crush this size would utilize about 80 percent of the industry's 1979-80 processing capacity—now estimated at 1,350 million bushels, up slightly from last season. The industry operated at 78-percent capacity in 1978-79, near the long-term average rate.

EXPORTS PROJECTED AT NEW HIGH

In recent years, about one-half of U.S. soybean production was exported either as beans or products, and export demand will again be an important pricemaking factor in 1979-80. Exports are projected at around 0.8 billion bushels, a new high and compares with 753 million shipped last season. Lower U.S. prices combined with further growth in meal and oil demand overseas will provide the impetus. Increased competition from South American soybeans and meal following April-May 1980 harvest will act to slow U.S. export movement in the last half of 1980.

Increased demand for protein meals is expected in both Europe and Japan as feeding of hogs and poultry continues to expand. Also, the U.S.S.R. is likely to import about 1½ million metric tons of soybeans this marketing year, up slightly from 1978-79. The Soviets have become a regular importer of U.S. soybeans in recent years, reflecting improved livestock feeding practices and short sunflower crops.

As of October 14, outstanding export sales of U.S. soybeans to the U.S.S.R. for 1979-80 totaled 1.1 million tons, and to mainland China about 0.2 million tons.

SOYBEAN OIL USE UP; EXPORTS ARE STRONG

U.S. soybean oil supplies in 1979-80 are projected at about 13 billion pounds (5.8 million metric tons), compared with 12 billion (5.5 million tons) last season.

Domestic use is expected to total around 9½ billion pounds, about 6 percent more than in 1978-79. Soybean oil's price advantage is the major reason for increased usage despite larger prospective supplies of cottonseed and sunflower oils and lard. The domestic consumption of soybean oil has shown a strong uptrend for many years and now accounts for nearly two-thirds of all food fats and oils utilized in the United States, and over 80 percent of the edible vegetable oils. Soybean oil is the major contributing factor to increased per capita consumption of U.S. food fats, which reached a record 57 pounds (fat content) during 1978-79.

Soybean oil exports in 1979-80 are projected at 2.2 billion pounds, down slightly from last season's record high 2.3 billion pounds. Commercial sales will continue heavy and concessional sales under title I, Public Law 480 will pick up. Announced sales allocations are 110,000 metric tons of vegetable oils, about double the 1978-79 level, while title II donations continue at the 100,000 ton level. Also, the export demand will be affected by the final outturn of oilseed crops in many foreign countries—especially India and Brazil.

Brazil, the major competitor in world markets for U.S. soybeans and meal, is importing U.S. soybean oil this season. As of October 14, outstanding export sales of U.S. soybean oil to Brazil stood at 29,000 tons.

Soybean oil prices (crude, Decatur) in 1979-80 are expected to average slightly lower than the 27½ cents last season. Increased competition from other sources of vegetable oils both here and overseas will tend to check any price rise in U.S. soybean oil. The principal uncertainties which could benefit oil prices would be any unexpected pickup in export demand from India, China, or the U.S.S.R.

SOYBEAN MEAL GAINS DOMESTICALLY

U.S. soybean meal supplies are estimated at about 24 million metric tons compared with 22.3 million last season. Domestic use is projected at 17 million tons, 1 million more than in 1978-79. The increases in hog and poultry production point to heavy feeding of high-protein meal. Poultry accounts for 41 percent of soybean meal fed, hogs 31 percent, cattle 22 percent, and edible protein products 2 to 3 percent. While the number of cattle on feed probably will be less than in 1978-79, they likely will be finished off to heavier weights.

Soybean meal exports are estimated at 6½ million metric tons compared with 6 million in 1978-79. Further increases in livestock and poultry production in a number of major meal-consuming countries are in prospect. Also, feed grain prices are likely to rise relative to

protein meal prices and this will encourage additional use of protein supplement.

A supporting factor has been the decline in the U.S. dollar against some major currencies. Since early 1979, however, the dollar has appreciated against the Japanese yen and remained stable in relation to most European currencies. The United Kingdom is a notable exception where the pound has strengthened relative to the dollar in 1979.

Over half of our meal exports are to the European Community with Japan and East Europe also ranking as large importers. The bulk of U.S. soybean meal moving abroad is in the form of unprocessed soybeans since many countries prefer to process soybeans themselves.

Soybean meal prices (44-percent protein, Decatur) are expected to average slightly below the 1978-79 level of \$210 per metric ton.

EDIBLE VEGETABLE OIL OUTPUT RISING

U.S. production of fats and oils in 1970-80 is projected to rise to 17 million metric tons, up nearly 3 million tons or about one-fifth from last year. Most of this gain is due to larger edible vegetable oil production since animal fat production is expected to increase very little from 1978-79. Growth in domestic demand for edible vegetable oils is expected to moderate as the U.S. economy slows, and growth in consumption may fall below last year's above-trend rate of 8 percent (soybean oil).

Here are outlook highlights for other major fats and oils:

Cottonseed oil supplies are estimated at 1.7 billion pounds—about one-fifth above 1978-79. Domestic use may increase slightly from 0.6 billion pounds in 1978-79 and exports are expected to rise above the 0.7 billion pounds shipped last season.

About one-half of U.S. cottonseed oil production has been exported in recent years. A strong preference for cottonseed oil in Western Europe, South America, and Egypt has enabled it to maintain a 2- to 3-cent premium over soybean oil, which likely will continue in the year ahead.

Coconut oil imports during the 1979-80 marketing year may decline slightly from 435,000 metric tons last season, if coconut prices continue near their currently high levels over the next few months.

World copra production is expected to increase about a tenth from 1978-79's 4.7 million tons, as output prospects improve in the Philippines, the world's major producer-exporter of copra and coconut oil. The Philippine government has proposed a cartel of the coconut oil processing industry in that country. It is too early to analyze the impact a cartel would have on world coconut oil trade. Cartels in the fats and oils industry generally do not work because of the interchangeability and substitutability in many end-uses.

Coconut oil prices (crude, Pacific coast) advanced from about \$700 per metric ton in the summer of 1978 to about \$1,265 in July 1979, then declined to \$970 in September 1979. The marketing year average was \$1,071 per ton or nearly two-thirds more than the \$657 average during 1977-78. Coconut oil prices during 1979-80 may be relatively more steady than last season, possibly averaging as much as a fourth lower. Historically, coconut oil prices have shown wider fluctuations than

other fats and oils prices primarily because of weather conditions in the Philippines.

Palm oil imports into the United States during 1979-80 may increase somewhat from last season's 127,000 metric tons. Prices have already become more attractive to U.S. food manufacturers and availabilities from Malaysia are increasing. World production of palm oil this season is projected at 4.3 million tons, up about 10 percent from the 3.9 million tons of 1978-79. The United States does not produce any palm oil, and imports, which are duty free, come mainly from Malaysia.

During the 1978-79 marketing year, palm oil sold for more than soybean oil and imports declined nearly a fourth—to the lowest level in 5 years. Palm oil prices on the west coast averaged \$695 per ton (19 percent above 1977-78) while soybean oil at Decatur averaged \$600 (up 11 percent)—a difference of \$95 per ton. The price difference in 1977-78 averaged \$60 per ton.

Palm oil prices in mid-October 1979, at \$650 per ton, are competitive with domestic soybean oil at \$632 per ton—after adjusting for transportation costs from the west coast to the Midwest and allowing for the higher refining loss in palm oil.

Lard production in 1979-80 is estimated at 1.2 billion pounds (545,000 metric tons), up a tenth from last year, reflecting larger hog slaughter. Domestic use likely will total around 1 billion pounds and exports (including shipments to U.S. territories) around 0.2 billion pounds, both up slightly from 1978-79. The United Kingdom and South America are major markets.

Increasing lard output, coupled with larger supplies of edible vegetable oils this year, likely will cause lard prices to average slightly below the 1978-79 level of 25 cents per pound (tanks, loose, Chicago), or \$551 per metric ton.

Tallow (edible and inedible) and grease production for the 1979-80 marketing year is projected at about 7 billion pounds (3.2 million metric tons), up slightly from last year due to heavier slaughter weights of cattle and increased pork production. During 1978-79, edible tallow output was up significantly while inedible tallow and greases were off. Edible tallow accounts for nearly 15 percent of the total tallow and grease produced and its share has gained.

Domestic use of tallow and grease may increase slightly from the 4.2 billion pounds of last season, while exports may total near the 2.7 billion pounds of 1978-79. Increases in petrochemical feed stock prices may help strengthen the demand for natural fats and oils such as tallow and greases.

Inedible tallow prices (bleachable fancy, Chicago) probably will average below last season's level of 23 cents per pound (\$507 per metric ton), in spite of continuing strong demand and increased costs of collecting and rendering animal fats. Prices in late October, at 21 cents per pound, were about 1½ cents below a year ago.

SUNFLOWER SUPPLY DOUBLES

U.S. sunflower seed supplies in 1979-80 are estimated at a record 3.8 million metric tons, double last season's level, due to record plantings and yields.

Although crushings and nonoil use will continue to expand, more than three-fourths (3 million tons) of the U.S. supply will be available for export. Sunflower seed exports in 1978-79 totaled a record 1.4 million tons, up 45 percent from the season before. Europe and Mexico are major markets. Nonoil use of sunflower seed (birdfeed and confectionery) accounts for less than 5 percent of U.S. disappearance.

Farmer's prices for 1979 crop sunflower seed probably will average slightly below last season's \$240 per metric ton. The Duluth-Superior port strike stopped export movement in August and September just when the new harvest was about to begin. This resulted in a substantially larger carryover than earlier anticipated. And with this fall's record harvest, storage and transportation facilities are being taxed—resulting in lower prices to farmers. However, export demand will be at a new high and may lead to a postharvest seasonal price rise. Storage facilities in Minnesota and the Dakotas are short this year because of the bumper sunflower crop.

Sunflower is produced mainly in the Red River Valley area of North Dakota, South Dakota, and Minnesota, and on a smaller scale in Texas. Of course many other States grow sunflowers, but national data are not available. USDA's Crop Reporting Board surveys only these four States but they probably account for 90 to 95 percent of the total U.S. production.

North Dakota is the Nation's leading sunflower State, accounting for nearly 60 percent of this year's 3.7 million ton crop. Minnesota is second, accounting for about 25 percent.

Sunflower production has jumped in recent years, spurred by the development of high-oil content seed (40 percent) and the hybrid varieties. Virtually all of the U.S. area planted this year is to hybrids. With more U.S. sunflower seed available and domestic demand for oil and meal increasing, the crushing industry is also expanding rapidly.

Sunflower seed crushing capacity in the northern producing areas is estimated at just under 1 million metric tons this year, about 40 percent above last season. With the 1978-80 season's crush projected at about 0.4 million tons, the industry will be operating at about 40 percent of potential capacity.

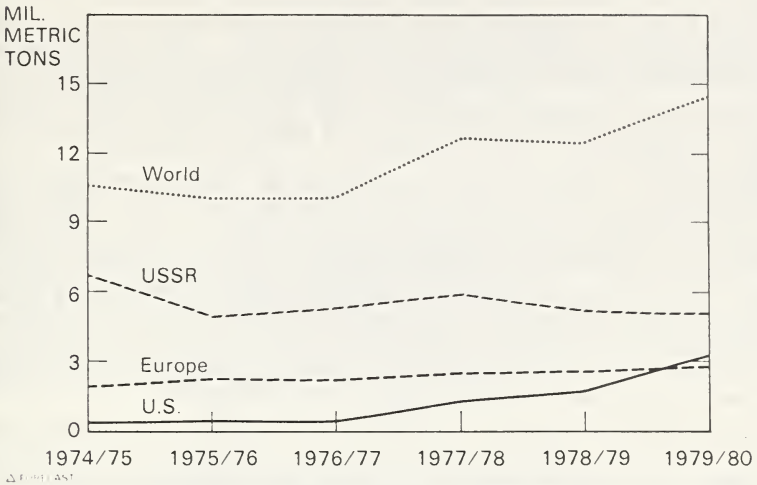
EXCESS CAPACITY NEXT FEW YEARS

Based on plant expansions and new mills announced by the industry (three new mills in North Dakota), the projected crushing capacity for sunflower seed is 2 million metric tons in 1980-81 and 2.2 million tons in 1981-82. Since sunflower seed crushings will rise at a much slower rate, processing capacity will remain excessive, if investment plans for new crushing facilities materializes. But in the long run, as the demand for sunflower oil and meal grows, the crushing industry will more fully utilize its potential capacity.

UNITED STATES MAY BECOME WORLD'S LEADING SUNFLOWER SEED PRODUCER IN THE 1980's

The relatively recent introduction of hybrid-oilseed-type sunflowers has boosted the United States second only to the U.S.S.R. in world

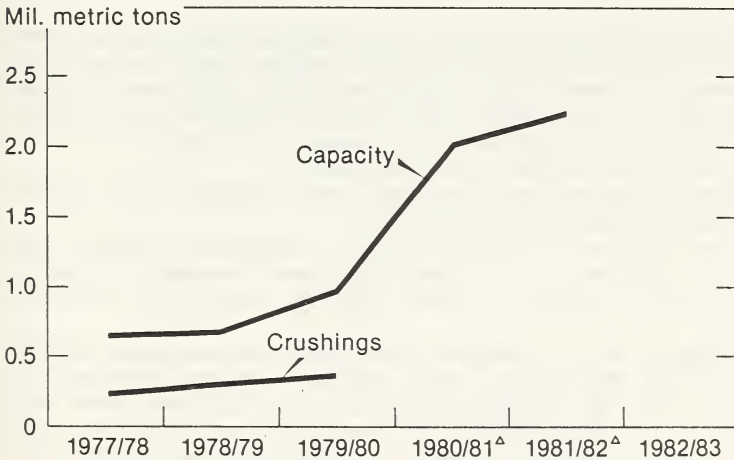
WORLD SUNFLOWERSEED PRODUCTION



USDA

Neg. ESCS 153-79 (9)

Estimated Sunflowerseed Crush Capacity*



*Northern production areas.

^AProjected capacity based on plant expansions and new mills announced by industry.

USDA

Neg. ESCS 153-79 (9)

sunflower seed production. The United States is the world's largest sunflower seed exporter; the Soviets crush nearly all their crop at home.

In the U.S.S.R. sunflower is the leading oilseed crop but production has stagnated in recent years at about 5½ million tons, sharply lower than previous highs. The Soviets plant open pollinated varieties which produce less per hectare than the hybrids. On the other hand, the Soviet sunflower seed oil yield is higher (50 percent) than in the United States (40 percent).

Expansion of sunflower seed production in the United States will continue during the decade ahead, possibly displacing the U.S.S.R. as the world's leading producer sometime in the 1980's. Increasing yields have made sunflower an attractive cash crop in the United States, especially in areas where crops such as flaxseed, barley, wheat, sugar beets, and other small grains are not so profitable. And the potential exists for increasing U.S. sunflower seed yields to 1½ tons per acre or more in the next few years with improved varieties of hybrid seeds. This would be more than double the U.S. average yield for 1979.

While U.S. production of sunflower is centered in the tristate area of the Red River Valley, where growing conditions are ideal, there are many other regions—such as the Southeast, Mississippi Valley, and some Western and Southwestern States—that have potential for large scale production. Also, the rapid expansion of the crushing industry creates more demand for sunflower seeds and its products.

SUNFLOWER OIL GAINING POPULARITY

With more food processors now producing and marketing sunflower cooking/salad oils and margarines on a national basis, domestic use of sunflower oil expanded to an estimated 78,000 metric tons in 1978-79, an increase of nearly two-thirds over the previous year. Further growth is expected in 1979-80, with domestic use projected at 110,000 tons, more than one-third above last year.

Sunflower oil prices have weakened some recently, with market quotes in mid-October about \$715 per ton.

Exports of sunflower oil during 1978-79 totaled about 40,000 tons, up slightly from the previous year. Egypt and Venezuela are major markets, and U.S. exports to these countries are likely to continue expanding.

The domestic use of sunflower meal totaled an estimated 180,000 tons in 1978-79, well above a year earlier. Continued expansion is expected in 1979-80, possibly to 220,000 tons. Sunflower meal is a high-protein ingredient utilized in livestock rations. Sunflower seed processed without dehulling produces a 28-percent meal; partial dehulling produces a 44-percent protein meal. Further removal of hulls is possible by screening the meal, resulting in a 51-percent protein meal.

PEANUT SUPPLY AT NEW HIGH

U.S. peanut supplies during 1979-1980 are estimated at 4.7 billion pounds (farmers' stock basis), up about 3 percent from last season. The production gain is due to increased yields since the national peanut acreage allotment at 1.6 million acres was unchanged from 1978.

U.S. use of peanuts for food reached a record 2 billion pounds in 1978-1979, an 8-percent increase over the previous year, and equals more than 9 pounds per person (in-shell basis). Further increases in edible uses are expected, although the rate of grain probably will be less than last season. Peanut prices have been relatively low compared with competitive foods and this is probably the main reason for the boost in consumption.

U.S. peanut exports have been at record high levels the last two seasons, totaling more than 1.1 billion pounds in 1978-1979. U.S. peanuts have been competitively priced in world markets since supplies from India and other major exporting countries were reduced. The 1979-1980 outlook is for another good export year, with the level influenced largely by India's peanut situation, since more U.S. peanuts will be available for export or domestic crush.

The U.S. loan rate for 1979-crop "quota" peanuts is 21 cents a pound, unchanged from the 1978 rate, and prices to producers are averaging near this level. The loan rate for "additional" peanuts, at 15 cents per pound, is up 2.5 cents from the 1978 crop rate.

246 OUTLOOK ON THE SOYBEAN PRODUCTION IN ARGENTINA

(By Miguel I. Moneta, President, AACREA, Argentina)

INTRODUCTION

Argentina's agricultural policy, as stated by the present Government ever since it took over in 1976, calls for a sustained increase of farm output. It shall be attained through an increase in productivity, an increased transfer of modern technology, and an expansion of existing agricultural frontiers and to hitherto marginal areas.

A market economy framework allows freedom to the individual and calls upon his creativity and initiative. The agricultural sector has been assigned a dynamic role within the economy, resulting in a significant increase of export surpluses.

For a very long period, the agricultural sector's possibilities to expand were held back by the lack of a consistent long-range agricultural policy. Therefore, the outstanding natural resources of the nation were not exploited to a full capacity.

Five basic instruments of the present policy should be taken into account: A. The progressive elimination of a previous state monopoly in the grain trade implies that production decision will be fundamentally affected by market conditions. B. The quasi-total elimination of export taxes (which reached levels of up to 40 percent on grains) imply that the farmer receives a fair approximation of the international price. C. An active Argentine participation in the world trade conference between grain importing and exporting nations. D. A careful planning of a series of medium- and long-term measures tend

TABLE I.—AGRICULTURAL SECTOR PARTICIPATION IN GROSS NATIONAL PRODUCT AT FACTOR COST VALUE

Year	Agricultural sector participation in GNP ^{1 2}	Grain sector participation as a percentage of 1	Livestock sector participation
1970	12, 2	55, 7	44, 3
1971	10, 9	57, 8	42, 2
1972	10, 6	57, 5	42, 5
1973	11, 3	58, 4	41, 6
1974	11, 0	59, 1	40, 9
1975	11, 0	58, 2	41, 8
1976	12, 1	58, 7	41, 3
1977	12, 0	58, 3	41, 7
1978	12, 5	59, 2	40, 8
1979 ¹	12, 0	60, 8	39, 2

¹ Estimated.

² Including livestock.

Source: Central Bank of Argentina.

to make more efficient the functioning of the country's infrastructure. E. The elimination of import taxes of agri-chemicals and a gradual reduction of those affecting imported farm machinery and other inputs.

The historic growth rate of the agricultural sector was affected primarily, as already mentioned, by the discontinuous nature of the announced policies and lack of a free market structure providing the necessary incentives to individuals. The sector's high growth potential never materialized and the sector never extracted itself from the low rate of development for the overall economy.

TABLE II.—ARGENTINE GRAIN PRODUCTION

(In thousands of metric tons)

Season	Foodgrains ¹	Feedgrains ²	Oilseeds ³	Total
1970/71	5.208	15.720	2.298	23.226
1971/72	5.734	9.635	1.877	17.246
1972/73	8.160	17.058	2.320	27.538
1973/74	6.876	17.969	2.519	27.364
1974/75	6.321	13.818	2.438	22.577
1975/76	8.879	12.470	2.891	24.240
1976/77	11.320	16.899	4.011	32.230
1977/78	5.610	18.383	5.955	29.948
1978/79 ⁴	8.412	16.701	6.700	31.813
1979/80 ⁴	7.820	15.475	8.000	31.295

¹ Wheat and rice paddy.

² Birdseed, oats, barley, rye, corn, millet and sorghum.

³ Sunflower seed, cottonseed, linseed, groundnut (unshelled), turnip, olive, sesameseed, soybeans, spurge, and tung.

⁴ Estimated (excluding cottonseed, olive, turnip, spurge, and tung).

Source: Secretary of State for Agriculture.

Table I renders the participation of the agricultural sector in the gross national product. After slumping from 1972, it shows a slight growing tendency in 1973, which becomes more significant in 1976. Throughout the period, grain production has shown a relative increase over livestock when expressed as a percentage of the total sector's participation gross national product. The increasing tonnage of grains production, table II and figure 1, is at the base of the sector's advance over the livestock sector in the agricultural aggregate. Total grain production underwent a significant expansion since the 1976-77 season. Over the past 10 years oilseeds production has steadily expanded, most notably since 1976-77. Total grain production in 1979-80 can be estimated at a slightly slower level than in the crop year. Oilseeds are expected to increase slightly or level, while food and feed grains might decrease some.

GENERAL OUTLOOK ON TOTAL GRAIN SUPPLY AND DEMAND

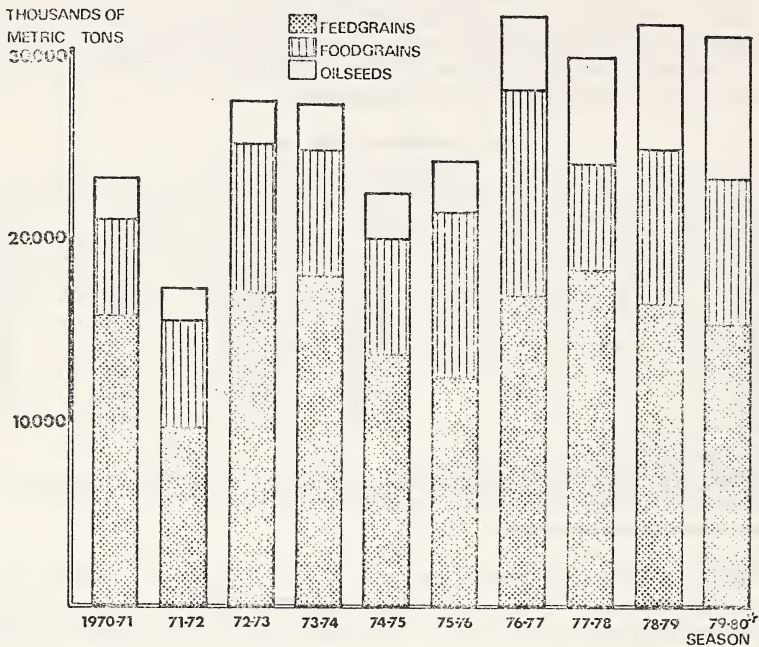
In table III and figure 2, we observed an important increase of total grains supplied since the 1976-77 season. As domestic demand and stocks remained practically constant since then, the additional supply was absorbed by the dynamic export sector.

This behavior is explained by: A. Argentina has a well-fed population with a low growth rate implying small changes in human grain consumption. B. In the Pampas, cattle fed and fattened mostly on pastures with little grain consumed as feed. C. Even if industrialized

internal volumes suffer a growing tendency, the same is not sufficient to absorb the important increases in production.

FIGURE 1

ARGENTINE GRAIN PRODUCTION



* ESTIMATED

SOURCE

SECRETARY OF STATE FOR AGRICULTURE

The continuous increase of Argentina's grain exports can also be observed in both fed grains as well as in oilseeds.

In the first place, it has to be pointed out that just at the beginning of 1977, the prohibition of exporting unprocessed oilseeds was removed, which had been in force during a long period.

It definitely incentivated production. Besides, the favorable conditions that reigned during that period in the international market for oilseeds, helped tremendously in the expansion of these products.

Oilseeds

In the last 10 years, Argentina's production of oilseeds has increased fourfold. Simultaneously, the production structure has varied substantially. At the beginning of this decade, sunflower production was the most important oilseed, its share being 40 percent of the total. It is evident, and so figure 4 and table V show, that soybean oil was practically unknown to the Argentine farmer.

In the 1978-79 season, the production of soybeans represented more than 55 percent of Argentina's oilseeds production, while sunflower production diminished its share to a little more than 20 percent. However, it is interesting to note that our sunflower production has doubled

in the last 10 years, and this points out more clearly the stunning increase in soybean production.

TABLE III.—TOTAL SUPPLY AND DEMAND¹

[In thousands of metric tons]

Season	Production	Beginning stocks	Total supply	Exports	Domestic demand ²	Total demand
1970/71-----	22.769	1.316	24.085	10.102	12.175	22.277
1971/72-----	16.767	1.767	18.534	4.950	12.372	17.322
1972/73-----	27.008	1.369	28.377	10.759	13.882	24.641
1973/74-----	26.811	942	27.753	10.775	14.213	24.988
1974/75-----	22.000	1.617	23.617	7.794	12.969	20.763
1975/76-----	23.744	1.957	25.701	10.430	11.979	22.409
1976/77-----	31.556	1.811	33.367	16.472	14.139	30.611
1977/78-----	28.948	2.058	31.006	15.324	12.613	27.937
1978/79 ³ -----	31.813	1.953	33.666	18.500	13.000	31.500
1979/80 ³ -----	31.295	1.800	33.095	17.800	13.250	31.050

¹ Includes: All wheat, linseed, oats, barley, rye, birdseed, millet, sunflower seed, corn, sorghum, groundnut (unshelled) soybeans, rice paddy.

² Includes: All wheat, linseed, oats, barley, rye, birdseed, millet, sunflower seed, corn, sorghum, groundnut (unshelled) soybeans, rice paddy.

³ Estimated.

Note: Possible differences between supply and demand mainly due to invisible stocks (unreported stocks mostly at producers, wholesalers, secondary industries and other end-consumers as well as supplies in transit).

Note: Data based on differing marketing periods as follows: Wheat, linseed, rye, barley, oats, birdseed: December to November, Sunflower seed: March to February, from 1974/75 onwards January to December. Corn, sorghum, groundnut: March to February.

Source: National Grain Board.

FIGURE 11

TOTAL SUPPLY AND DEMAND

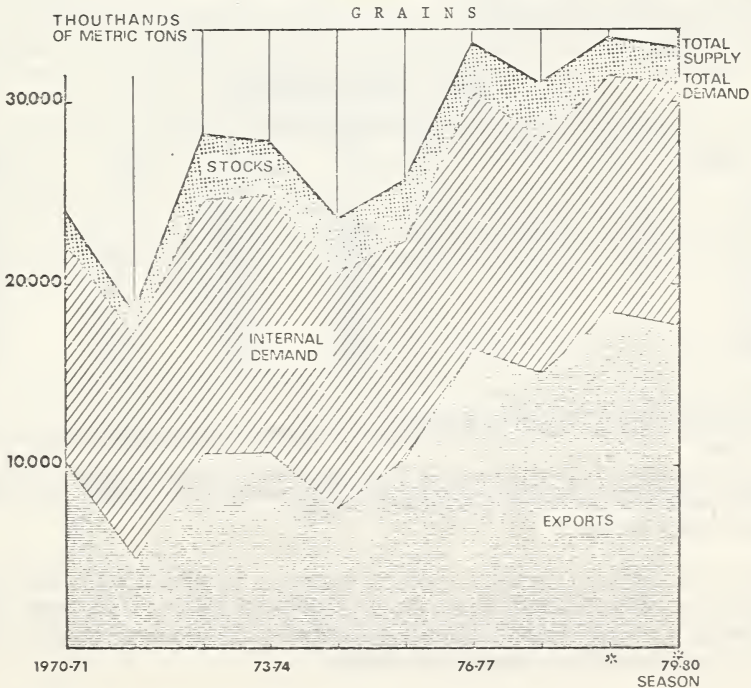
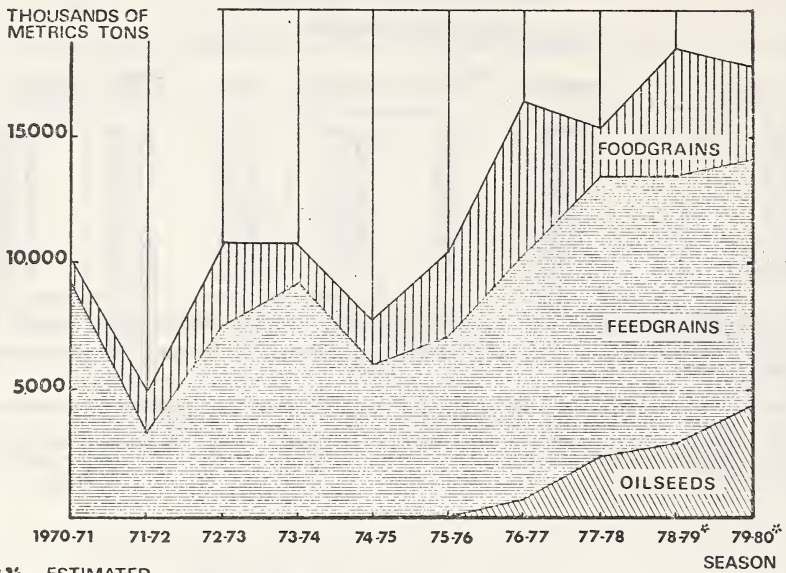


FIGURE III

TOTAL EXPORTS OF GRAINS



* ESTIMATED

SOURCE NATIONAL GRAIN BOARD

TABLE IV.—TOTAL GRAIN EXPORTS

[In thousands of metric tons]

Season	Foodgrains ¹	Feedgrains ²	Oilseeds ³	Total
1970/71	955	9.144	3	10.102
1971/72	1.580	3.369	1	4.950
1972/73	3.171	7.588		10.759
1973/74	1.555	9.220		10.775
1974/75	1.801	5.988	5	7.794
1975/76	3.250	7.069	111	10.430
1976/77	6.068	9.780	624	16.472
1977/78	1.746	11.141	2.437	15.324
1978/79 ⁴	4.952	10.637	2.911	18.500
1979/80 ⁴	3.600	9.800	4.400	17.800

¹ Wheat and rice paddy.² Birdseed, oats, barley, rye, corn, millet, and sorghum.³ Sunflower seed, cottonseed, linseed, groundnut (unshelled), turnip, olive, sesame seed, soybeans, spurge, and tung.⁴ Estimated.

Note: Data based on differing marketing periods as follows: Wheat, linseed, rye, barley, oats, birdseed: December to November. Millet, Sunflower seed: March to February from 1974/75, onwards January to December. Corn, sorghum, groundnut: March to February. Soybeans, rice paddy: April to March.

Source: National Grain Board.

For the 1979-80 period, a new increase can be estimated in the production of oilseeds, which can be forecasted at about 20 percent; this estimate was calculated taking into account the planned sowing, and if climatic conditions remain favorable.

Soybean production in Argentina—Present trend and future outlook

Although the origins of soybean production in Argentina can be traced back to the beginning of the century, it is not until the 1960's that the crop starts to attain some significance.

However, the great expansion of soybeans comes in the 1970's when the area sown grows from 37,000 to 1,500,000 hectares, and production soars from 59,000 to 3,700,000 tons, at an annual rate of 50.6 and 78.62 percent, respectively.

The causes that explain this spectacular growth are many. Some are strictly economic—a favorable crop return, due, mainly to favorable relative prices in the last 3 years. Others are of a technical nature; as the possibility of improving soil fertility, and the possibility of double cropping with winter crops.

But the most important reason for its success is the generalized use of an adequate technology assuring exceptional yields. This situation has allowed yields to increase at a rate of 2 bushels per acre per year, in the last 10 years, as shown in figure XI.

Geographical distribution of production

In order to evaluate the potential growth of soybean production in Argentina, four soybean production areas can be determined, according to its return levels, its potentialities and characteristics, which are totally distinctive to each. In the adjoining map the geographical limits of each region are delineated, and, in figures XII and XIII, the evaluation of the area sown and the production of each region, is pointed out.

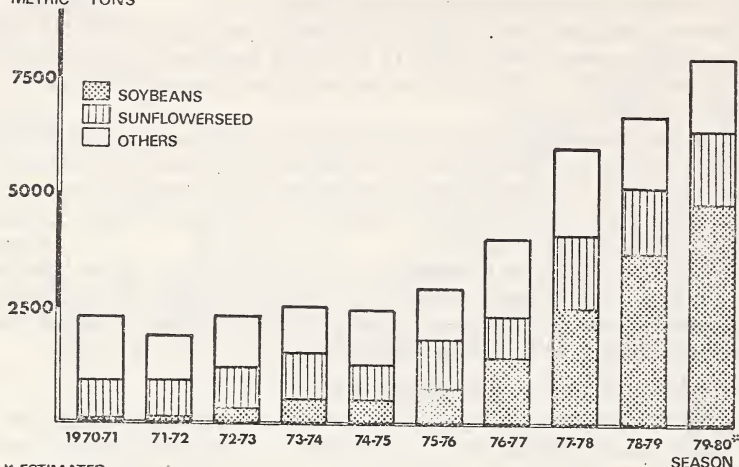
1. *Typical Corn Region (Corn Belt)*—Soybean production in Argentina today is concentrated in an area which, by its ecological characteristics, general infrastructure and traditional crop cultivation, is the most productive agricultural area in the country.

It comprises the northeast region of the province of Buenos Aires southeast of Santa Fe, and a very narrow strip of the southeast of Cordoba.

The area sown in the last season in this area exceeds 2 million acres, representing 68 percent of the total area sown in the country, and its output nears 74 percent of the national total, having increased tenfold during the last 5 years.

FIGURE IV

ARGENTINE OILSEEDS PRODUCTION

THOUSANDS OF
METRIC TONS* ESTIMATED
SOURCE

SECRETARY OF STATE FOR AGRICULTURE

TABLE V.—ARGENTINE OILSEEDS PRODUCTION

[In thousands of metric tons]

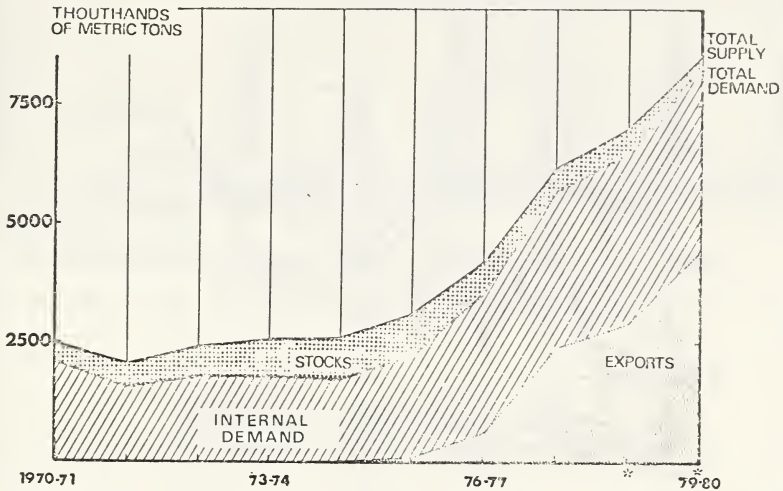
Season	Soybeans	Sunflower seed	Others ¹	Total
1970/71	059	830	1.409	2.298
1971/72	078	828	971	1.877
1972/73	272	880	1.168	2.320
1973/74	496	970	1.053	2.519
1974/75	485	732	1.221	2.438
1975/76	695	1.085	1.111	2.891
1976/77	1.400	900	1.711	4.011
1977/78	2.500	1.600	1.855	5.955
1978/79 ²	3.700	1.480	1.570	6.700
1979/80 ²	4.800	1.600	1.600	8.000

¹ Linseed, groundnut (unshelled), turnip, olive, sesame seed, spurge, and tung.² Estimated (excluding cottonseed, olive, turnip, spurge, and tung).

Source: Secretary of State for Agriculture.

FIGURE V

OILSEEDS TOTAL SUPPLY AND DEMAND



* ESTIMATED

SOURCE: NATIONAL GRAIN BOARD

TABLE VI.—OILSEEDS,¹ TOTAL SUPPLY AND DEMAND

[In thousands of metric tons]

Season	Production	Beginning stocks	Total supply	Exports	Internal demand ²	Total demand
1970/71.....	2,298	183	2,481	003	2,114	2,115
1971/72.....	1,877	173	2,050	001	1,580	1,581
1972/73.....	2,320	081	2,401	-----	1,820	1,820
1973/74.....	2,519	070	2,589	-----	1,821	1,821
1974/75.....	3,438	164	2,602	005	1,773	1,778
1975/76.....	2,891	179	3,070	111	2,114	2,225
1976/77.....	4,011	195	4,206	624	2,901	3,525
1977/78.....	5,955	210	6,165	2,437	3,305	5,742
1978/79 ³	6,700	300	7,000	2,911	3,600	6,511
1979/80 ³	8,000	500	8,500	4,400	3,900	8,300

¹ Includes: Sunflower seed, linseed, groundnut (unshelled), turnip, olive, sesame seed, soybeans, spurge, and tung.² Includes: Possible differences between supply and demand mainly due to invisible stocks (unreported stocks mostly at producers, wholesalers, secondary industries, and other endconsumers as well as supplies in transit). Data based on differing marketing periods as follows: Linseed: December to November. Sunflower seed: March to February, from 1974/75; Onwards January to December. Groundnut: March to February. Soybeans: April to March.³ Estimated (excluding cottonseed, olive, turnip, spurge, and tung).

Source: National Grain Board.

SOYBEAN YIELDS IN THE MAIN PRODUCING COUNTRIES

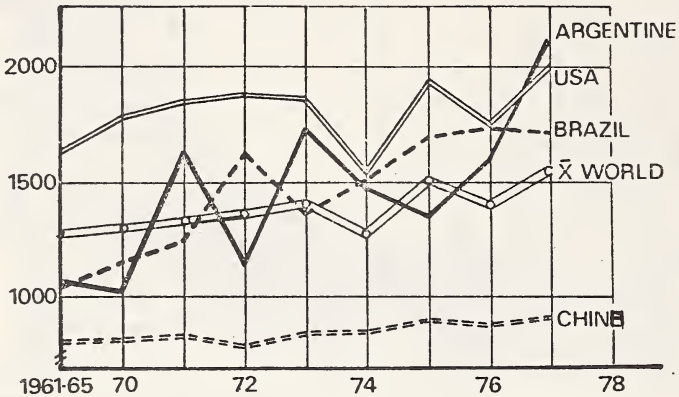
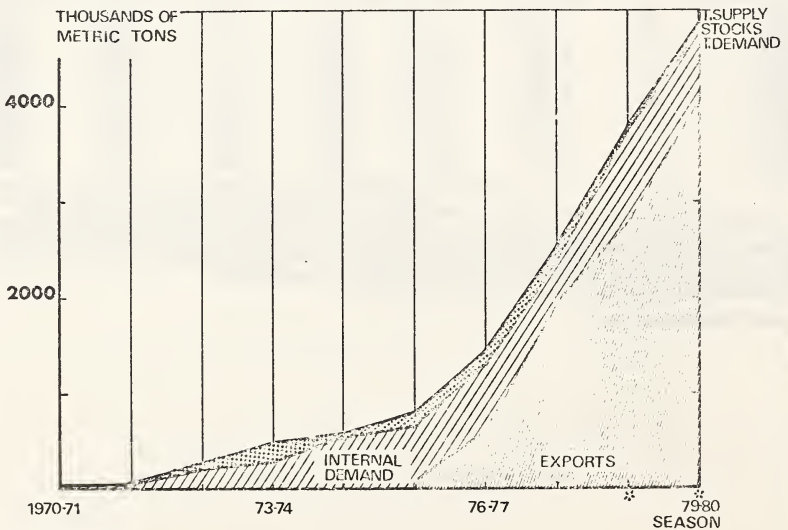


FIGURE VIII

SOYBEANS TOTAL SUPPLY AND DEMAND



* ESTIMATED

SOURCE NATIONAL GRAIN BOARD

TABLE VII.—SOYBEANS, TOTAL SUPPLY AND DEMAND

(In thousands of metric tons)

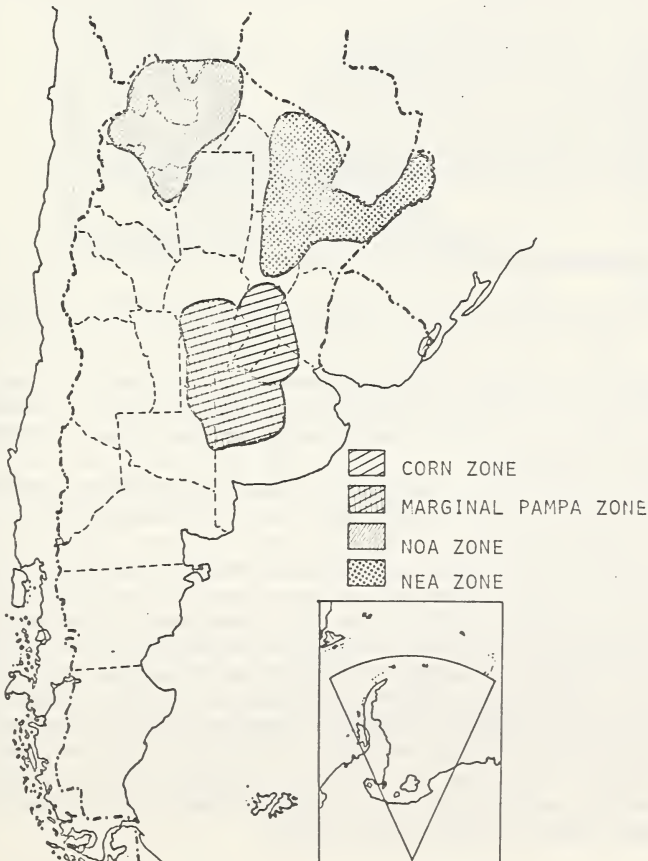
Season	Production	Beginning stocks	Total supply	Exports	Domestic demand ¹	Total demand
1970/71	59	1	60		42	42
1971/72	78		78		58	58
1972/73	272		272		221	221
1973/74	496	4	500		307	307
1974/75	485	4	579		560	560
1975/76	695	85	780	110	546	656
1976/77	1,400	37	1,437	623	668	1,291
1977/78	2,500	54	2,554	1,970	394	2,364
1978/79 ²	3,700	.090	3,790	2,800	966	3,766
1979/80 ²	4,800	.024	4,824	4,080	694	4,774

¹ Includes: Possible differences between supply and demand due mainly to invisible stocks (unreported stocks mostly at producers, wholesalers, secondary industries, and other end-consumers as well as supplies in transit). Soybeans marketing year: April to March.

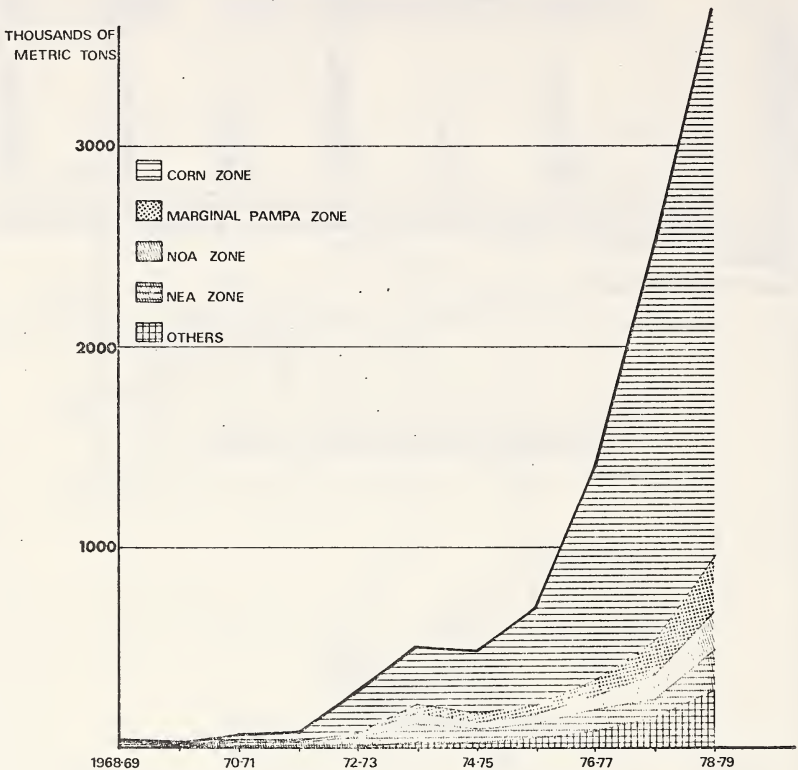
² Estimated.

Source: National Grain Board.

SOYBEAN PRODUCTION AREA



EVOLUTION OF THE SOYBEAN PRODUCTION

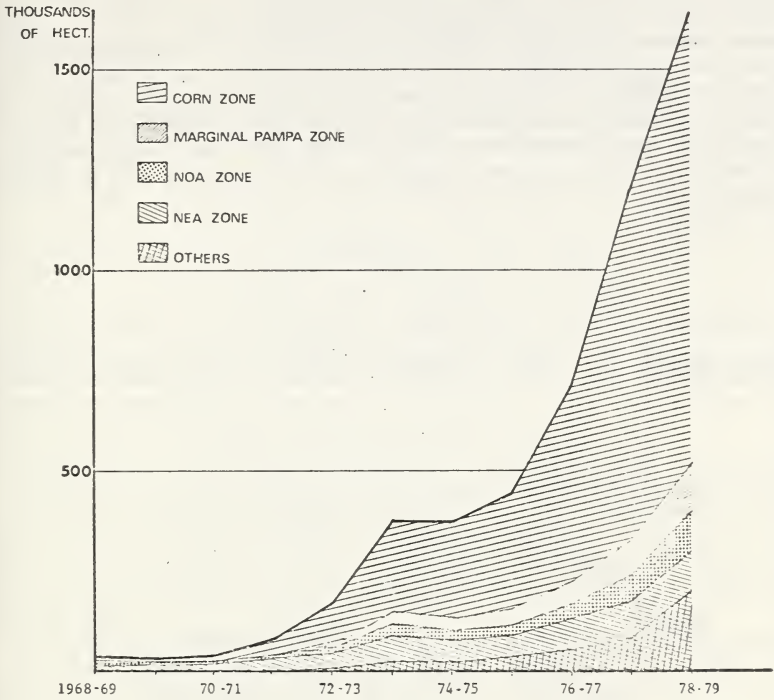


This explosive growth taking into account that the area sown in the region has increased five times, and average yields, have doubled in that short time, is not only due to one factor but to the interaction of a number of elements:

The fundamental reason that explains the introduction of soybeans in a rotation system in the area, is that it has allowed an increase in the incomes of the farms.

This behavior is related to prices and to relative incomes of soybean/corn. If soybean prices are compared versus its natural competitor—corn—a steep increment can be appreciated in the relative prices with respect to the latter, in the last season. This can be easily explained because soybeans, up to that year, had benefited from a special tax policy, as it was considered a priority crop. After 1976, when export taxes were abolished for grain, all crops fell in the same category. Simultaneously, if the evolution of the gross income received by the producer is analyzed for each of the crops at harvest time; it can be noted that soybeans are more profitable than corn. The incomes from soybeans were two times that of corn.

EVOLUTION OF THE SOYBEAN AREA PLANTING



This behavior can be easily explained taking into account the favorable conditions existing during those seasons. Particularly by the use of an advanced technology that produces high unit yields.

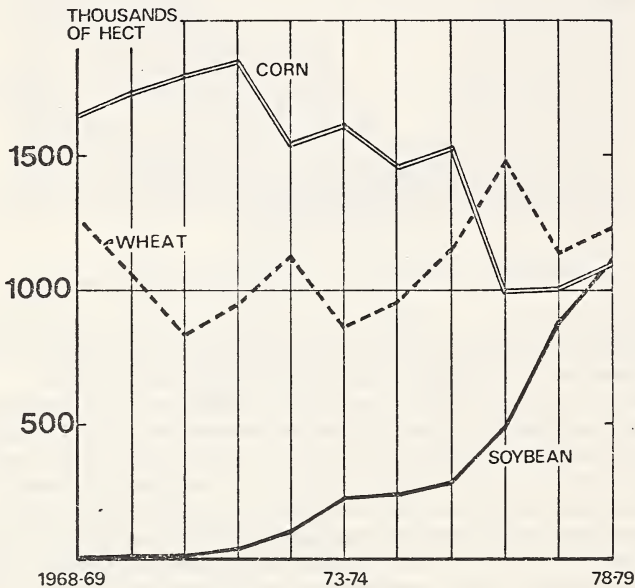
Another aspect that has considerable influence in the explosive expansion of soybeans in the Argentine corn area, is the possibility it allows to modify rotations and the use of the soil in the region.

To be able to interpret this process it is necessary to keep in mind that the actual situation before soybeans were introduced into the region, was that corn existed as a monocrop. It showed a tendency to decreased yields due to a slow impoverishment of the soil. Now, it is worthwhile taking into account that fertilization is poorly developed in this region due to a scarce economic return, since the relationship cost/product, has surpassed, in general, the physical answer obtained. In 1967, for example, the Argentine producer had to sell 9.3 kilograms of wheat to be able to buy 1 kilogram of nitrogen, while the American counterpart needed only 2.3. In May 1972, the situation was better, but even so the Argentine producer had to give 1.6 of

corn to buy 1 kilogram of nitrogen; while his American counterpart only needed to sell 2.7 of corn. Today, even if the relationship costs/product is not so unfavorable, although to the scant regional efficiency is not of the best, and results are somewhat erratic, that technique has not reached thorough popular understanding. Taking into account what was expressed above, the appearance of soybeans became a very attractive option for the producer of the corn region, owing to its capacity of fixing atmospheric nitrogen, therefore improving soil fertility. This characteristic—combined with the crop's high return—allowed the rotation system employed to be diversified and to become more efficient.

GRAPH XX

EVOLUTION OF THE SOWING AREA IN THE CORN ZONE



Another reason that can explain the quick diffusion of soybeans in the region without a significant deploy of other competitive crops, is related, to placing itself as a second yearly crop, after the winter species—wheat, oats, green peas, linseed, et cetera. This idea of a double crop is increased year by year, and actually, it can be supposed it comprises nearly the 40 percent of the total soybean areas in the corn region.

Other factors exist—perhaps, not so important as the above mentioned, but not to be left aside; that have taken part in determining the significant expansion of the soybean crop in the corn region. Among them, there can be mentioned the relative decrease of the necessary investment for the implantation of soybeans in regard to corn, for the 1977-78 season.

As an example, actually the level of necessary outputs to develop the crop is superated only in a 50 percent by corn, a situation that has nothing to do with the 150 percent that was necessary in the 1976-77 period.

This behavior is related with the relative price fall of agrochemicals during the last years in this country. This is due to the fact that the growing tax reduction was allowed to place these products in the market at lower prices, in real values, than 3 years ago.

Also among the elements that contribute to explain the development of soybeans in this country, the growing of this crop can be mentioned as a means of controlling, in a profitmaking way, Johnson grass, which has hindered the development of the corn area. By the use of preplant herbicides that are used in soybeans, Johnson grass has not only come under control, but has kept fields in production.

Regarding the evaluation of the possibilities of the future growth of soybeans in this region, it is necessary to consider the following factors:

With reference to the planted area, this would keep a relation to the relative soybean-corn prices should the situation arise of a very favorable price for the farmer—2.5 or more—it would be reasonable to expect an increase in the area sown, in addition to the already sown for 1979-80 season.

This behavior would inevitably bring a partial displacement of corn, and not an integration of it as it has been going on until today. As can be observed in graph XX, the increase in soybean area is not in direct proportion to the diminishing of corn.

In relation to the unit yields—its evolution still basically depends on two elements:

A more ample general outlook on the use of an advanced technology which, though, it is available to farmers is not widely accepted at present, and

Climatic conditions that can limit crop development in the next season. At this point, it would be timely to indicate that in the last 3 years, there were exceptional climatic conditions, and that the hydric supply for crops, will probably not repeat itself forever.

Considering the antagonistic effect of these factors, one can suppose that the influence of one will annul the other, making it possible to maintain level yield in this area in the short term.

The above brings us to state as a conclusion: A behavior of no increase or of maintenance of the soybean production level in the corn area of Argentina; allows to foresee—if the former is true—a similar volume to the one estimated for the 1979-80 season.

Marginal Pampa Region

This area involves the center and northwest of the Province of Buenos Aires, north of route 5, the south of Cordoba, and the north-east tip of the province of La Pampa.

It is a typical milo corn zone and cattle fattening area, which has been slowly turning to crop agriculture, in these last years, because of

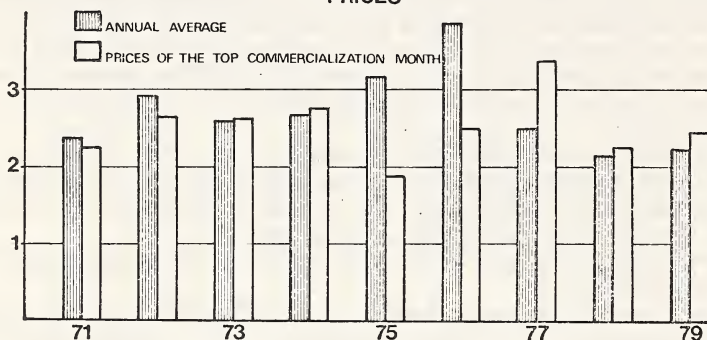
higher economic returns. Notwithstanding this tendency, the cattle area for direct grazing still remains relevant, making up no less than 50 percent of farms.

This region presents interesting ecological conditions for the probable expansion of soybeans, through a gradual reduction of the area affected to milo corn. It will be so if the low economic return for the latter is maintained. It should also be pointed out that within the pampa marginal zone, there exists microregions with a high productive potential—the Cordoba peanut area, for instance, in which soybeans can become a serious competitor.

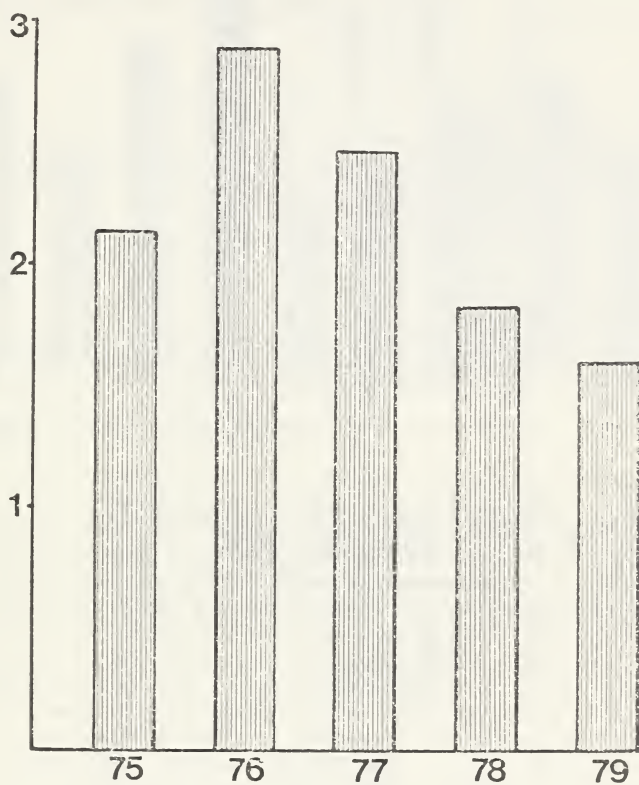
In the last two seasons the share for the region in the total production fluctuated between 7 percent and 8 percent respectively.

On the other hand, yields show acceptable levels with a growing tendency, owing to the spreading of technology provided by the corn area. However, these do not keep at a level with the latter owing to the lack of information on some local variables of the crop—planting date, varietal adaptability, et cetera—that widely influence the final result.

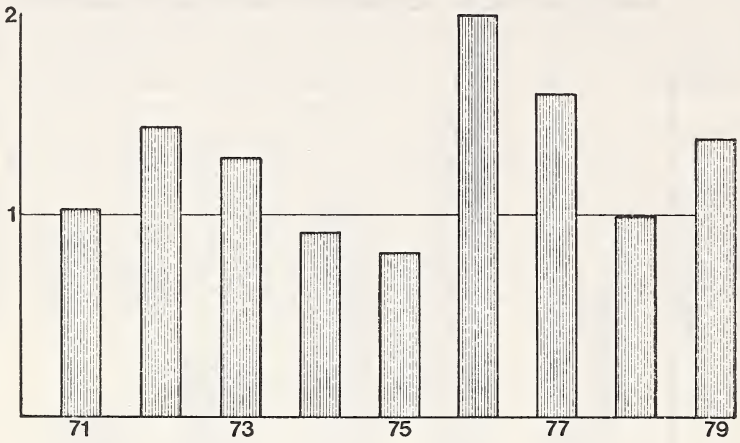
RELATIONSHIPS SOYBEAN/CORN
PRICES



COSTS RELATIONSHIP SOYBEAN/CORN

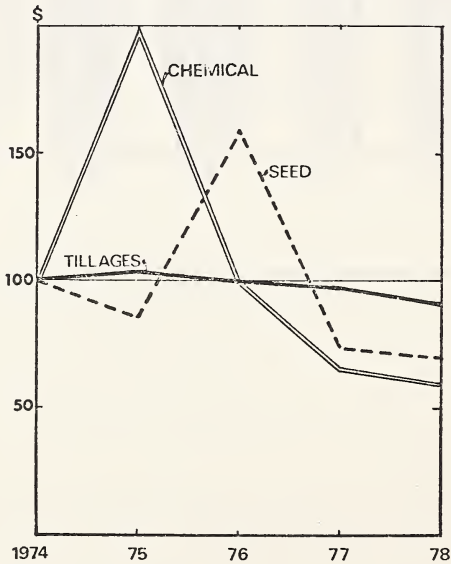


INCOMES RELATIONSHIP SOYBEAN/CORN

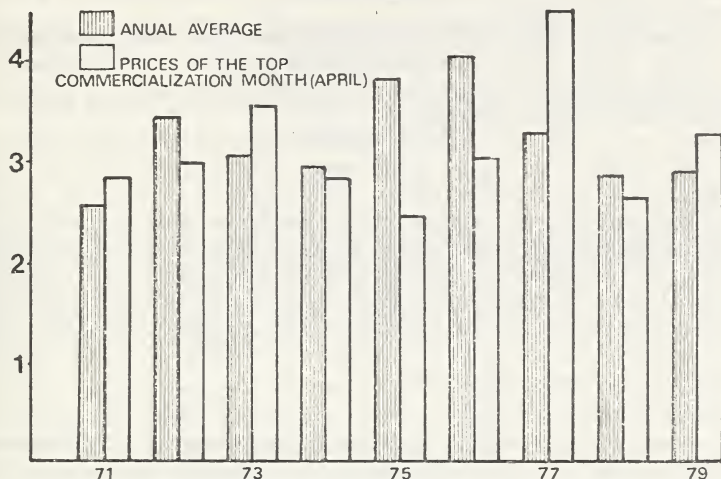


EVOLUTION OF INPUT COST FOR SOYBEAN CROP

COSTANT PRICES BASIS 1974:100



RELATIONSHIPS SOYBEAN / SORGHUM PRICES



SOURCE : NATIONAL GRAIN BOARD

Taking all this into account, the marginal pampa region is an area of a very promising future, regarding the evaluation of soybean production in Argentina, if the relation prices of grains and oilseeds is favorable to the latter. The behavior we refer to will also be influenced by the evolution of relative price beef-grain. If the tendency observed in the last 3 years is kept up—unfavorable prices for cattle—rotations will become longer, increasing the number of years of annual crops. To be able to keep up these plans for the use of the soil, it will imply increasing the share of soybeans because of its improvement of quality effect through the addition of nitrogen to the soil. Regarding the southwest zone of the Province of Buenos Aires, even if it can show apt ecological conditions for the growth of soybeans, it has a serious competitor in sunflowers, a crop that is very well adapted to the region, and that has a good market outlook.

Considering all this, the expansion of soybeans will depend on the evolution of relative prices regarding sunflowers and the development of varieties with a short cycle and high potential yields.

Northwest Region (Noa)

The northwest soybean region comprises the Provinces of Tucuman, Salta, and Jujuy. It shows a very stable evolution in its crop, which produces a diminishing share in the national total, owing to the sustained growth that took place in the production of the corn region.

However, within this zone there are some areas with excellent ecological conditions and with a good prospective for the development of soybeans, where it has to compete with the regional crops—sugarcane, string beans, et cetera.

With reference to the possibilities of expansion of soybean growing in the region, they will be conditioned by :

The return of local alternative crops.

Improvement of the regional infrastructure concerning storage capacity, transport, market, et cetera, factors that will raise the marketing costs of the goods produced, diminishing the general return of the activity.

A rebate in the costs on the crop's protection and planting, obviously higher than in the corn area because of a difference in freight, and higher prices in agro-chemicals and seed, plus a shortage of machinery, et cetera.

To sum up the above, it can be pointed out that the double effect of lower real prices and higher costs makes the soybean activity a not very attractive one for the farmer. Its expansion in the area will be conditioned not only by relative prices, but by an improvement in the regional infrastructure conditions, which will allow a cost reduction. This cannot be considered during a short term. What will partially alter this taken for granted evolution, perhaps, will be the application of promotional measures for marginal zones—tax exceptions or credits for clearing woods, for instance—which will lead to generate a higher interest for the crop in the region.

Northeast Region (NEA)

This zone comprises the Provinces of Misiones, north of Corrientes, east of Formosa, and part of Chaco, and its main characteristic is the great variety of ecological and production conditions in which the crop is cultivated. Possibilities to expand the crop show up in some regions within the zone, among which Misiones stands out because of its soil and climate conditions. However, in this area soybeans face the competition of traditional perennial crops with high seasonal returns—yerba mate, tea, tung, et cetera, and it also faces the serious danger of soil erosion.

In Corrientes, on the other hand, the crop has been successfully tried in the north, but its massive diffusion is limited by the disparity of soils in the area; and also by the lack of information on crop techniques adapted to the zone, and regional conditions of infrastructure—markets, communications, machinery, et cetera.

In some fertile regions of the Province of Chaco, one can think of supplanting any of the traditional crops for soybeans—grain sorghum, for instance—and the low return for sorghum.

According to present circumstances, it can be concluded that the northeast zone shows slight possibilities of a quick medium range shall be in function of the relative prices and the interest displayed by state and people alike concerning regional infrastructure.

CONCLUSIONS

It can be stated that in the short and medium terms, the traditional corn area will continue to determine the volume of Argentina's soybean crop.

A possibility for quick growth is possible in the marginal Pampas region, which has adequate infrastructure and ecological conditions for the expansion of the crop.

The northwest and northeast regions, on short notice, will not gravitate significantly, though it is reasonable to expect gradual increase in the future.

Finally, soybean production will keep expanding, but at a lower rate than in the last 2 years. As less optimal acreage is brought into production, average unit yields will tend to decrease.

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WORLD AND U.S. OUTLOOK FOR LIVESTOCK AND POULTRY

(By James E. Nix, Livestock Analyst, World Food and Agricultural Outlook
and Situation Board)

World production of red meats and poultry will be large again in 1979 as increases in pork and poultry more than offset declines in beef and veal.¹ Even though the world expansion in pork and poultry is expected to slow in 1980, increased output will more than offset slightly lower beef and veal production and total meat output will once again increase.

In the United States, relatively favorable conditions existed for livestock and poultry producers during 1978 and part of 1979. The demand for meat was favorable and livestock and poultry prices were at levels sufficient for good producer profits. Feed supplies have been adequate to support an expanded livestock output, but feed prices have been higher than a year earlier.

U.S. livestock and poultry producers, however, have seen a dramatic turnaround in their profits during the second half of 1979. Cattle feeders realized sizable profits on fed cattle marketed during the spring and into the summer. But by late summer profit margins had dwindled, and this fall many are incurring sizable losses. These losses are the result of high prices paid for feeder cattle in early 1979 and feed costs which this summer ran over 20 percent above a year earlier. Profits for hog and poultry producers were also very favorable through the first half of 1979, but their profits dwindled this summer, and they are expected to incur losses this fall.

Several factors in the 1980 picture point to less favorable conditions for U.S. livestock and poultry producers than in 1979. There will be a larger supply of meat, particularly in the first half of the year, than during 1979 and hog and poultry prices will be lower. Also, increases in cattle prices will be less than the very sharp increases of early 1979. Production costs will be higher and the demand for meat and eggs probably will suffer from a weaker economy.

Many of the same factors that point to less favorable conditions for producers suggest that the consumer will fare better at the meat counter in 1980 than in 1979. There will continue to be some shift in the types of meats available and much uncertainty remains about just how consumers will react to these shifts.

¹World inventories and production as used in this paper include estimates for the major producing countries. Estimates are not available for some countries.

PRODUCTION COSTS

Record large U.S. feed grain and soybean crops are being harvested this fall. As of October 1, the corn crop was estimated at a record 7.4 billion bushels, up 4 percent from last year's record level. With carry-over stocks of about 1.3 billion bushels, corn supplies will be a record 8.7 billion bushels, 6 percent greater than a year earlier. Total U.S. feed grain supplies for 1979-80 are projected at a record 270.2 million metric tons, up 5 percent from a year earlier.

Even with record large U.S. supplies of feed grains, prices are expected to average above year-earlier levels. World grain production is expected to be down from the 1978-79 level. With this lower world grain crop, a strong foreign demand is expected for the U.S. supplies. This, coupled with an anticipated strong demand from the domestic livestock and poultry industry, suggests these higher grain prices. Farm prices of corn are expected to average \$2.35 to \$2.65 per bushel in 1979-80, compared with \$2.20 in 1978-79 and \$2.02 in 1977-78.

During the 1979-80 crop year, there may be larger than usual regional differences in corn prices, particularly during the harvest season. The regional differences will have significantly different impacts on various groups of livestock and poultry producers. In the Corn Belt, particularly the western portion, corn prices may be much lower than in other parts of the country, largely because of storage and transportation limitations. Large supplies of corn at relatively low prices would favor the hog and cattle producers in this area. It could also lead to only a minimum selloff of hog breeding stock this fall and winter as producers in this area attempt to market more of their corn through livestock. But for poultry producers, who are primarily located in regions distant to the major corn-producing area, corn prices may be much higher. Even though broilers are efficient converters of grain into meat, these higher corn prices may have a dampening effect on broiler production.

Based on conditions as of October 1, this year's soybean crop was estimated at a record 2.2 billion bushels, up 18 percent from a year earlier. The 1979-80 total supply of soybean meal is projected to be a record 26.2 million short tons, up 6 percent from 1978-79 and 16 percent from 1977-78. World production of soybeans and of total oilseeds is also expected to be substantially larger than a year ago. As with the feed grains, the domestic and export demand is expected to be strong again this year. With this large supply, soybean meal prices for 1979-80 are expected to average below the previous year's level. For 44 percent protein meal at Decatur, prices are expected to average \$160 to \$200 per ton in 1979-80, compared to \$190 in 1978-79 and \$164 in 1977-78.

Costs for most other input items for livestock and poultry production are up sharply this year. In September, prices paid by farmers for fuels and energy were 44 percent higher than a year earlier; for tractors and other machinery, prices were 11 percent higher; for building and fencing, prices were 10 percent higher; and interest on farm real estate was 23 percent higher. Prices for these and other production items are expected to continue to rise in 1980, resulting in further increases in the cost of producing livestock and poultry.

DEMAND PROSPECTS

During 1979, the demand for meat in the United States has been exceptionally good. Employment has been at a high level, and consumer income has continued to rise. Also, meat consumption and prices have probably been "caught up" in the general inflation psychology as consumers have made large purchases in anticipation of further price rises.

Even though there are many uncertainties, the U.S. general economic outlook for the coming year continues to be bleak, particularly for the early months. For the year, real per capita income is expected to decline from the 1979 level and no growth in real gross national product is anticipated. Also, the unemployment rate is expected to rise above the 1979 level. These factors suggest that the demand for meat in 1980 will be somewhat weaker than it has been this year.

In addition, further increases in energy costs will affect the demand for meat in 1980. Higher energy bills means consumers will have to allocate a larger share of their income to pay these bills. Shortages of gasoline and higher prices slowed travel during 1979. If this happens again in 1980, it could once again reduce fast food sales and dampen the demand for meat.

If an economic recession prevails through early 1980 with recovery coming by midyear, it could present a dramatically different demand pattern than existed in 1979. This could also contribute to a different price pattern next year if first-half 1980 meat supplies are larger than a year earlier and second-half 1980 supplies are about the same as during the last half of 1979.

Worldwide demand may be slowing because of an economic slowdown. Real economic growth in many countries other than the United States is also expected to slow in 1980. This could further slow the demand for meat in some countries.

BEEF AND VEAL

World production of beef and veal in 1979 will be down from a year earlier. This lower level of production is the result of the reduction in the cattle inventory that has taken place since 1976. While U.S. total beef and veal production in 1980 is expected to total near the 1979 level, world production is expected to drop slightly.

Canadian producers are taking steps to rebuild their cattle herd, but the total inventory is still expected to be slightly below the year-earlier level at the beginning of 1980. Beef and veal production will be down from the 1978 level this year and a further decline is anticipated for 1980 as herds are rebuilt.

Beef and veal production in Mexico during 1979 is expected to drop a little below the year-earlier level. Production during 1980 is likely to remain near the 1979 level as the cattle inventory holds at about its 1979 level.

Cattle herds in South America are being rebuilt, and the 1980 inventory may be up a little from the 1979 level. In Argentina, the 1980 cattle inventory may be down a little; in Brazil a slight increase is likely. In 1980, beef and veal production in Argentina may be down

slightly from the 1979 level while a small increase may occur in Brazil.

In the European Community (EC) the 1979 cattle inventory was slightly larger than a year earlier and another small increase is anticipated for 1980. Beef and veal production in the EC has been increasing slowly since 1977 and another small increase is likely in 1980. Any production increases in the remainder of Europe will be small.

Much uncertainty surrounds the outlook for beef and veal production in the Soviet Union. A slight increase in the 1980 cattle inventory had seemed likely with beef and veal production holding at about the 1979 level. However, with an expected reduction in feed crop production in the Soviet Union, it may be difficult to maintain numbers this year and increase production in 1980.

In Australia, the 1980 beginning year cattle inventory is expected to continue the decline that began in 1977. As a result of the reduced inventory and herd rebuilding that will be underway during 1980, beef and veal production for 1980 will likely show a sizable decline.

The New Zealand cattle inventory was down again in 1979, but a slight buildup in numbers seems likely for 1980. Beef and veal production in New Zealand has declined since 1976, but based on current prospects this trend could be reversed in 1980.

In the United States, the cattle inventory declined from 1975 until 1979 and beef and veal production has declined since 1976. The lower production has resulted in higher cattle and beef prices. These developments are causing a turnaround in the beef industry and an upward trend in cattle numbers and beef production is beginning.

Beef prices in North American markets are expected to remain high in 1980 and this will continue to heavily influence prices in the international beef markets. Beef and veal production in some of the major exporting countries will be down in 1980 and this is expected to reduce export availabilities. Prices in the United States, however, are expected to be attractive and 1980 beef and veal imports may remain near the 1979 level.

U.S. cattle herd rebuilding underway

The U.S. cattle and calf inventory was reduced from 132 million head in 1975 to 110.9 in 1979, a 16-percent decline. With the sharp rise in cattle prices that began in 1978, conditions have become more favorable for cattlemen.

This year, cattlemen have taken steps to rebuild the cattle herd. Through the first three quarters of 1979, cow slaughter was 34 percent below a year earlier. In addition, cattlemen indicated on July 1, 1979, that they were holding 8 percent more heifers for beef cow replacements than a year earlier. These developments will result in a larger breeding herd on January 1, 1980, than a year earlier.

The total cattle and calf inventory will also rise, primarily as a result of a 16 to 18 percent reduction in total cattle and calf slaughter during 1979. The January 1, 1980, total cattle and calf inventory is expected to be around 112 or 113 million head.

Total cattle and calf slaughter in 1980 is expected to be near the 1979 level. A larger cow herd at the beginning of 1980 will result in a calf crop that will be a little larger than that estimated for this year. This could result in a 3 to 4 percent increase in the total cattle and calf inventory for January 1, 1981.

Feeder cattle prices to remain strong

The selloff of the cattle herd has resulted in a sharp reduction in the feeder cattle supply and a substantial rise in feeder cattle prices. Under very favorable conditions this year, feeder cattle prices rose to record high levels. As fed cattle prices rose through the spring, cattle feeders bid aggressively for feeder cattle, pushing feeder cattle prices higher. Seasonally favorable grazing conditions and reduced grazing demands, however, enabled feeder cattle producers to take advantage of the situation by holding their cattle longer than usual and this helped to further strengthen prices.

This fall, during the period when feeder cattle marketings normally rise and prices come under pressure, feeder cattle prices held unusually strong. Favorable early fall grazing conditions have been a major factor in this price strength.

The supply of feeder cattle outside feedlots on October 1 this year was only about 1 percent below the year-earlier level. The 20 percent year-to-year decline in feedlot placements this summer, combined with a sharp reduction in calf and steer and heifer slaughter, has resulted in this small decline in the feeder cattle supply. Moisture conditions, particularly in the winter wheat grazing area, will be a major factor determining feeder cattle prices through this fall and into the winter. Feed cattle prices will also be an important determinant of feeder cattle prices because they will determine how much cattle feeders can afford to pay for the feeder cattle.

Grazing conditions did begin to decline during October and fed cattle prices have remained under the pressure of large meat supplies. Under these conditions, feeder cattle prices will probably decline some from their October level as marketings rise.

Feeder cattle prices rose to record high levels during 1979. Prices in 1980 are not expected to average much higher. Choice 600- to 700-pound feeder steers at Kansas City will average in the low \$80's for 1979. The number of calves expected to be born during July-December 1979 is greater than the year earlier. These additional calves could also help to hold down feeder cattle prices in 1980. Unless fed cattle prices average higher during 1980 than is currently expected, prices for feeder steers at Kansas City may average no higher than the low-to-mid \$80's next year.

1980 U.S. beef production to hold to near the 1979 level

U.S. commercial beef production for 1979 will total about 21.1 billion pounds, almost 3 billion pounds (12 percent) less than in 1978. This year's production consists of a higher percentage of fed beef than during the last several years. About 77 percent of this year's cattle slaughter will come from fed cattle. This high percentage of fed cattle in the slaughter mix has resulted in heavier dressed weights, up around 4 percent from the 1978 average.

Fed cattle slaughter in 1980 may about equal the 1979 level and again account for over three-fourths of the total slaughter. On October 1, 1979, there were 13 percent fewer cattle on feed than a year earlier. With the October 1, 1979, feeder cattle supply being only slightly lower than a year earlier, there is expected to be enough cattle to support relatively high levels of placements this fall and in 1980.

Nonfed steer and heifer slaughter has dropped sharply below the

year earlier level during 1979 and may hold at near the same level next year. Cow slaughter for 1979 could be around one-third lower than in 1978. Little change in the level of cow slaughter is expected for 1980 but a small increase could occur.

With little change expected in the level of slaughter of all classes of cattle, not much change in beef production is expected. Average weights in 1980 are likely to hold near the 1979 level but feed supplies and cost of grain will affect weights.

Fed cattle prices to average higher in 1980

Fed cattle prices rose to record high levels in 1979, and for the year, choice 900 to 1,100 pound steers at Omaha will average \$67 to \$68 per hundredweight, about 30 percent higher than in 1978. There has been considerable variation in prices during the year with peak prices occurring in the spring.

Advances in 1980 cattle prices will be limited by large supplies of competing meats, particularly during the first half of the year. A large supply of pork and poultry will put total meat supplies at record-high levels during the first half of 1980. Also, economic conditions suggest that the demand for beef will not be as strong as in 1979. This supply and demand outlook is expected to prevent a repeat of the sharp rise in cattle and beef prices that occurred last winter. Choice 900 to 1,100 pound steers at Omaha may average in the upper-\$60's to near-\$70 during January-June 1980.

Cattle prices during the second half of 1980 could strengthen from their first-half level if the expansion in pork and poultry production slows and the general economy rebounds as expected. Fed cattle prices are expected to rise less in 1980 than this year and for the year, Choice 900 to 1,100 pound steers at Omaha may average a little over \$70. The level and pattern of performance of the general economy, however, will have a significant impact on prices.

PORK

World production of pork has increased each year since 1975. Another increase in production is anticipated for 1980 with much of the increase coming from the United States.

Production in the EC is rising above the year-earlier level this year and output in 1980 may hold at about this level. In other parts of Europe, pork production may also hold at about the 1979 level. If feed supplies in Eastern Europe are severely short, this could adversely affect pork production and result in some decline in 1980 production.

Soviet Union pork production for 1979 is also expected to be a little larger than a year earlier. Short feed supplies in the Soviet Union may also affect their pork production. A small decline in production for 1980 is likely, but, depending on feed supplies, it could be a sharper decline.

Japan continued to expand pork production during 1979 and a further expansion is likely for 1980. Korea has gotten into a surplus pork supply situation and they may cut back on production in 1980.

Canada has been rapidly expanding pork output. Production trends in Canada normally parallel those in the United States. However,

sharp increases in Canadian pork production occurred sooner than in the United States during this latest expansion phase. Canadian pork production in 1980 is expected to once again increase but not as sharply as it has for the past 2 years.

Significant changes in the U.S. pork production picture portray a vastly different outlook for 1980 than existed a year ago.

U.S. pork production to continue expanding

Commercial pork production for 1979 will total about 15.2 billion pounds, around 15 percent more than in 1978. Year-to-year increases were modest in the first quarter of 1979, but sharply escalated during the remainder of the year. This strong expansion in production is expected to continue through at least mid-1980, and perhaps on through the summer.

After holding sow farrowings relatively stable through 1977 and much of 1978, hog producers began a strong expansion phase in late 1978. Sow farrowings during the December 1978–February 1979 period rose 16 percent above a year earlier. Farrowings in the March–May and June–August period increased 21 and 17 percent, respectively. For several months leading up to this expansion and during most of the expansion period, hog prices were relatively high and feeding margins were favorable.

In recent months, hog prices have been significantly below a year earlier and feed prices have been higher. This has reduced producer profits and many hog producers are probably losing money this fall. Even though profit margins have tightened in recent months, hog producers are still planning substantial increases in sow farrowings. In September of this year, hog producers reported intentions to farrow 13 percent more sows in the September–November period and 10 percent more in the December–February period.

If producers carry through with these intentions, pork production could be up 16 to 18 percent during the first half of 1980 and 7 percent or more during the summer. Contributing to this first-half increase in production could be the selloff of some of the breeding inventory. Hog producers in the major corn-producing areas, however, may not sell off much of their breeding stock if corn prices are depressed in some areas because of the large supply and storage and transportation problems.

Negative net returns to producers are expected this fall and through the first half of 1980. These losses probably will cause producers to pull back on production. A small year-to-year decline in the number of sows farrowing during the March–May 1980 period is likely. Large, highly capital intensive hog operations will be reluctant to trim their breeding inventory as long as they can cover their out-of-pocket (cash) costs. But there is still a large number of small production units which are more flexible in their production plans. These smaller production units probably will react more quickly to the negative net returns and bring about a decline in the number of sows farrowing.

Slaughter in the fourth quarter of 1980 will largely come from the March–May 1980 pig crop. Thus, with fewer sows expected to farrow in the March–May period, production could drop a little below the October–December 1979 level. For the year, 1980 pork production could be almost a tenth larger than the 15.2 billion pounds expected for 1979.

Early 1980 hog prices to continue low

Hog prices have come under pressure this year with the expansion in pork production. Large supplies of poultry meats have also pressured hog prices. Continued large supplies of pork and poultry will keep hog prices at relatively low levels during the coming year.

Early in 1979, hog prices rose to their highest level since 1975. In February, prices for barrows and gilts at seven markets averaged \$54 per hundredweight, \$5 above a year earlier. Since February, however, hog prices have declined sharply. This summer they averaged just over \$38 per hundredweight, \$16 below the February level, and about \$10 lower than in July-September 1978.

Continued increases in pork production this fall are resulting in further declines in hog prices. Preliminary estimates of federally inspected pork production for 4 weeks in October showed production running 25 to 30 percent above a year earlier. During this 4-week period hog prices dropped below \$35 per hundredweight, around \$20 below a year earlier.

Fourth quarter 1979 production probably will exceed the October-December 1978 level by about 20 percent. Prices will stay under pressure from these large supplies and probably average in the mid-\$30's for the quarter. For all of 1979, prices for barrows and gilts at seven markets will average about \$42 per hundredweight, \$6 below the 1978 level.

Both pork and total meat production will be large during the first half of 1980. With these large meat supplies and a rather bleak outlook for the performance of the general economy, hog prices are expected to remain low. Barrow and gilt prices in the low- to mid-\$30's appear likely through the spring. As year-to-year increases in pork production narrow during the summer and the performance of the general economy rebounds, hog prices are expected to strengthen a few dollars. Further strength is expected in the fall of 1980, if there is near to slightly less pork than a year earlier. For all of 1980, prices for barrows and gilts at seven markets will probably average in the mid-\$30's.

LAMB AND MUTTON

World production of lamb, mutton, and goat meat has been relatively stable during the last 3 years, but below the 1975 and 1976 level. New Zealand and Australia, the two largest producers, have experienced different trends in production for the last few years. Production in Australia has declined since 1976. Sheep numbers in Australia, however, were up some in 1979 and production may rise a little in 1980. After declining in 1977, production in New Zealand has increased each year since and will probably rise again in 1980. With some increase in production expected in these two major producing countries, a small increase in 1980 world production is likely.

In the United States, lamb and mutton production will be down again this year. This continues the long-run downward trend in production. On January 1, 1979, the U.S. inventory of sheep and lambs was 12.2 million head, down 1 percent from a year earlier and the smallest inventory since records were begun in 1867. The 1979 lamb

crop is estimated at 8.02 million head, virtually the same as the 1978 crop. This is the first time in the last two decades that the lamb crop has not declined from the previous crop by at least 1 percent.

Through mid-October 1979, cumulative lamb and mutton slaughter for the year was about 8 percent below the year-earlier level. Average weights have been a little heavier than a year earlier so production was only off about 6 percent. This year's slaughter levels and lamb crop suggest that the January 1, 1980, inventory of sheep and lambs will be a little larger than a year earlier.

Prices for choice slaughter lambs during 1979 have generally run a few dollars per hundredweight above the 1978 level. For the year, choice slaughter lambs at San Angelo will average in the upper-\$60's, \$2 or \$3 above the 1978 level.

With the likely event of a slightly larger inventory in 1980, a small increase in U.S. lamb and mutton production is likely. Lamb prices in 1980 may then run just a few dollars under the 1979 prices, particularly during the first half of the year when total meat supplies are expected to be large.

POULTRY MEATS

World production of poultry meats in 1979 will be considerably larger than a year earlier. This continues the rapid rate of expansion that has taken place since 1975, when short feed supplies caused a reduction in output in some countries and only small increases in many others. World production of poultry meats is expected to rise again in 1980, but the increase likely will be less than that for this year. Again, feed supplies will be a big factor determining the exact level of poultry production, but supplies and prices of competing meats will also be a factor.

A strong rate of expansion in poultry production in South America likely will continue in 1980. Both Brazil and Argentina are showing large increases in 1979, and this is expected to continue in 1980.

Poultry production in the EC will be up in 1979 and is expected to increase again in 1980. However, since the EC is already producing more than they consume, the export market will determine the extent of growth in 1980. Other parts of Europe are also expected to show increases in poultry production, but because of poor crop growing conditions, feed supplies may pose a problem for Eastern Europe. Feed supplies in Eastern Europe may limit poultry production, but no large declines are expected.

In the Soviet Union, poultry production for 1979 is expected to be about 10 percent greater than a year earlier. Another large increase is planned for 1980, but this year's large Soviet grain shortfall might affect these plans. The Soviets have announced that they plan to avoid distress slaughter as a result of the anticipated grain shortfall.

Poultry production continues to increase in Japan, and another sizable increase is likely during 1980. As for other Asian countries and for Oceania, production in 1980 is likely to be moderately above the year-earlier level.

In North America, poultry production increased sharply in 1979. This is not expected to be the case in 1980, however, as large supplies of pork and higher feed prices hold down poultry production.

In the United States, prospects facing the poultry industry in the year ahead are not nearly so favorable as they were a year ago. Larger

supplies of pork and lower pork prices are forcing prices for poultry meat lower. Also production costs continue to rise, further squeezing profits.

Expansion in U.S. broiler production to slow

In 1980, broiler producers in the United States could face the worst situation in many years if prospects turn out about as expected. Higher feed prices, large pork supplies, and an unfavorable general economic situation all point to a bad year for broiler producers in 1980.

Broiler producers made a profit every quarter except two from 1975 through mid-1979. Profit margins were good during the first half of 1979. But this summer, producers began to lose money as broiler prices dipped and production costs continued to rise. Broiler producers will be in a severe cost-price squeeze this fall as production costs will be above year-earlier levels and broiler prices weaken as a result of very large pork and poultry supplies. Production costs will continue to rise in 1980 as all inputs are expected to be priced above the year-earlier level. Thus, with broiler prices expected to be considerably below a year earlier, negative returns are likely through much of the year.

The extended profitable situation that has existed for broiler producers has resulted in sharply increased broiler output in 1979. Federally inspected broiler production in 1979 will exceed the year-earlier level by around 11 percent and total nearly 11 billion pounds ready-to-cook weight (RTC). During 1979, broiler production has not been limited by hatchability (the ratio of the number of chicks placed to the number of eggs set in incubators) problem as it was in 1978. Hatchability has improved this year, and this summer the percentage increases in chicks placed exceeded the percentage change in eggs placed in incubators 3 weeks earlier.

In recent weeks, producers have begun to slow their expansion. Year-to-year increases in egg sets and chicks placed have narrowed considerably. Producers will continue to reduce the rate of expansion in production in coming months as broiler prices drop to their lowest level in years. The large supplies of pork will offer intense competition for broilers. Production during the early months of 1980 will likely be larger than a year earlier. The increases, however, will be much less than those seen in 1979. Broiler producers will be taking a wait and see attitude to see how low hog prices drop. If hog prices drop to the low \$30's, broiler producers will find themselves in a severe cost-price squeeze and they will make some adjustments. By next spring, production could drop below the year earlier. With an unprofitable outlook for broiler producers in the year ahead, 1980 broiler production may drop a little below the 1979 level.

Lower U.S. broiler prices expected

Broiler prices in early 1979 were considerably higher than a year earlier. The wholesale nine-city broiler price was 49 cents per pound in February of this year, 6 cents higher than a year earlier. Prices held at relatively high levels until about midyear, when they dropped sharply. Prices normally strengthen seasonally in June and July, but this year they declined. Prices dropped from 49 cents in May to 43 cents in July. They have continued to decline and have generally held near or under 40 cents since July. They will probably average in the

upper 30's this fall. For the year, broiler prices will average about 1 cent per pound below 1978's overage of 44.5 cents.

Wholesale broiler prices will remain under pressure from larger pork and poultry supplies and a weak general economy in early 1980. During the first half of the year they will probably average in the upper 30's, around 10 cents below the year-earlier level. If producers cut back on production during the last half of 1980, prices could strength to near year-earlier levels in the summer. If pork production is near year-earlier levels next fall, broiler prices could rise above the 1979 level. For the year, 1980 wholesale broiler prices will probably average a little below the 1979 level. The producer profit margin, however, will likely be substantially different.

U.S. turkey production continues to rise

Turkey production has increased sharply during 1979. January-June federally inspected turkey production totaled 736 million pounds, 17 percent more than a year earlier. Slaughter during the last half of this year may total over 1.4 billion pounds, 7 percent more than a year earlier. For the year, 1979 turkey production will total almost 2.2 billion pounds, about 10 percent more than the 1978 total.

Turkey producers have had good profits for some time and they are not expected to face as unfavorable conditions next year as broiler producers unless they overexpand. However, recent hatch data indicates that turkey producers may be on their way to overexpansion. Turkey poults hatched in September were 40 percent above a year earlier and eggs in incubators on October 1 were up 39 percent. Considering the large supplies of other meats that will be available next year, turkey producers probably cannot make this large of an expansion and continue to make a profit.

In 1980, production costs will be above the 1979 level. Furthermore, the larger turkey production, combined with large supplies of other meats, will result in lower turkey prices in 1980. These higher production costs and lower turkey prices will reduce 1980 profit margins. Nevertheless, turkey output in the first half of 1980 is expected to be at least 20 percent above a year earlier and continue larger throughout the year. For the year, the increase in 1980 production may about match the 1979 increase.

The increased production of turkeys, larger cold storage stocks, and large supplies of competing meats will hold 1980 turkey prices under the 1979 level. The increased turkey production in 1979 has resulted in cold storage holdings of turkeys being above year-earlier levels. Stocks on September 30, 1979, totaled 429 million pounds, 15 percent above a year earlier. Stocks at the beginning of 1980 are also expected to be considerably above the level at the beginning of 1979.

The 1979 New York wholesale price of 8- to 16-pound young hen turkeys will average near the 1978 average of 66.7 cents per pound. Prices for 1980 may average 8 to 10 cents per pound lower as the large supply of turkeys and competing meats weigh heavily on the market.

EGGS

World production of eggs continues to expand. The United States, European Community, and Soviet Union are large producers of eggs,

and all three of these have continued to expand production in recent years. A further increase in egg production is expected during 1980, but the rise probably will not quite match that which is expected for 1979.

U.S. egg production continues to rise

U.S. egg production for 1979 will be about 2 percent greater than in 1978. Profit margins for egg producers have been favorable during most of 1979, as egg prices have been well above year-earlier levels. The New York wholesale price for grade A large cartoned eggs averaged 69 cents per dozen during the first half of 1979. This was 4 cents above the second half of 1978 and 11 cents above a year earlier. Prices for the last half of 1979 will average closer to the year earlier level. This will result in smaller profit margins for egg producers.

Egg production during the first half of 1980 will probably be 1 to 2 percent above the January-June 1979 level. Layer numbers will begin the year 1 to 2 percent above 1979. However, lower profit margins in the first half of 1980 could result in layers being near a year earlier by midyear. Egg production for the last half of 1980 could be near the 1979 level. This production pattern combined with a weak general economy in the first half of 1980 that rebounds in the last half of the year could result in January-June 1980 egg prices 5 to 7 cents per dozen under the 1979 average and July-December prices near the year earlier. Total 1980 egg production is expected to rise about 1 percent above the 1979 level.

CONSUMPTION AND RETAIL PRICES

In 1979, U.S. consumers have had about the same total quantity of meats available as they had in 1978. This meat supply has consisted of less beef, veal, and lamb and mutton, but more pork and poultry. Current prospects point to slightly larger meat supplies in 1980.

Per capita beef consumption has been down this year, as production declined sharply. Beef imports will be a little larger than in 1978 and partially offset the decline in production. Per capita beef consumption in 1979 will total near 107 pounds, about 11 percent (13 pounds) less than in 1978. Retail beef prices rose sharply during the first half of 1979. The January-June 1979 Bureau of Labor Statistics' (BLS) beef and veal price index averaged about one-third above the year-earlier level. During this period of sharply rising beef prices, beef supplies were showing their largest year-to-year decline. Also, increases in pork supplies were small during the first few months of the year, offering limited alternatives for the lower beef supplies.

Retail beef prices peaked in May and declined during the summer as pork and poultry production increased sharply. Also, gasoline shortages and sharply rising prices reduced travel and slowed the demand for beef, particularly at the fast-food restaurants. Retail beef prices this fall will probably remain near their late summer level and 22 to 24 percent above the year-earlier level. For the year, retail beef prices will average around 28 percent above the 1978 average.

In 1980, per capita beef supplies probably will be a little below the 1979 level. However, in early 1980, pork supplies will be increasing

sharply and poultry supplies will be a little larger than a year earlier. In fact, first-half 1980 meat supplies could be record large for that time of year. Thus, the early 1980 meat supply situation will be considerably different from that of early 1979 in that consumers will have more alternatives to beef. This large supply of meats is expected to limit beef prices rises during the first half of 1980. Also, a weak general economy in which consumers will be paying sharply higher heating bills will likely hurt the demand for beef.

A second-half 1980 rebound of the general economy is expected. With year-to-year increases in competing meat supplies expected to narrow from their first half level, increases in retail beef prices may be larger than in the January-June 1980 period. Retail beef prices in 1980 may average 6 to 10 percent above the 1979 average.

The larger 1979 pork production is resulting in about a 14-percent (9 pounds) increase in per capita consumption, compared to 1978. Year-to-year increases were small in early 1979 but rose to around 20 percent larger late in the year. Retail pork prices in the January-March 1979 period averaged 13 percent above the year-earlier level. Prices peaked in March and have trended downward since, and dropped below a year earlier this summer. For the year, retail pork prices will average slightly above the 1978 average.

Per capita pork consumption in 1980 will probably be 7 to 10 percent larger than in 1979 and the largest since 1971. The largest increases will occur in the first half of the year. By late 1980, per capita consumption may drop below the year-earlier level. First-half 1980 retail pork prices are expected to be sharply lower than the high levels of early 1979. Prices may rise during the last half of the year and average above the January-June period. The 1980 retail pork price may average 4 to 8 percent below the 1979 level, primarily because of the substantial early year declines.

Red meat prices in 1979 may average 16 to 18 percent above the 1978 level. With the large pork supplies and lower retail pork prices that are expected for early 1980, red meat prices may be only slightly above the year-earlier level. Second half 1980 red meat prices, however, are expected to rise above the July-December 1979 level, and for the year red meat prices could average 3 to 5 percent above the 1979 average.

Retail poultry prices in 1979 have followed about the same pattern as pork prices. First-half 1979 prices were considerably above the level of the previous year, but they are dropping below in the latter months of this year. In 1980, January-June retail poultry prices are expected to be sharply lower than a year earlier. Second-half 1980 prices, however, may average above the July-December 1979 level. The 1980 average retail poultry price may about equal this year's level.

On balance, U.S. consumers will have a large supply of meat available to them in 1980. A major uncertainty in the level of retail prices centers around how consumers will react to the larger pork supply. During 1979 as pork production expanded sharply, meat prices began to stabilize. The larger pork supplies in 1980 could again have a stabilizing effect on meat prices. Another major uncertainty concerns in performance of the general economy and how consumers will allocate their expenditures in the months ahead.

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DISCUSSION OF HOG OUTLOOK []

(By Richard [Crom, ESCS, U.S. Department of Agriculture)

Since I participated in the development of the livestock outlook, I am obviously not in a position to offer a critique of it; but let me elaborate on some of the specifics concerning hogs and then turn to some longer run considerations.

This year bears considerable resemblance to 1970 when pork production increased all year and hog prices declined. Price levels are much higher now; the peak monthly average price was \$54 this year compared with \$28 in 1970. But the price decrease from high month to low was 44 percent in 1970; we look for about the same percentage price decline this year.

PERCENT CHANGE FROM A YEAR EARLIER (BY QUARTER, 1979)

	1st	2d	3d	4th
Pork production.....	+5	+15	+19	(¹ +20-22)
Retail port price.....	+14	+4	-5	(¹ -10-12)
Hog price.....	+10	-10	-21	(¹ -30-34)

¹ Estimated.

Let's analyze forthcoming pork supplies and prices in terms of three stages of production in the hog supply—pigs on the ground, sows and gilts already bred, and probable farrowings of sows and gilts not yet bred.

Near term outlook

Hog slaughter for the rest of this year and the first half of 1980 will come from pigs in the September inventory and the September through November pig crop. With the exception of a few weeks, these pigs are here. Hogs weighing 60 to 180 pounds on September 1 were up 19 percent from a year ago; pigs weighing less than 60 pounds numbered 16 percent more than September 1, 1978. Farrowing intentions for September through November indicated a pig crop up 13 percent from a year ago.

Hog slaughter in the first half of 1980 may be up more than that indicated by the pig crop because of some liquidation of sows and boars. Last year over 200,000 hogs were added to the breeding inventory between December 1 and March 1 in the 14 major States. Next year this period probably will show some decrease.

Thus we look for:

Fourth quarter 1979 slaughter be up 20 percent from a year earlier.

First quarter 1980 slaughter to be up 20 percent.

Second quarter 1980 slaughter to be up 13 percent.

One must also consider that the severe winters of the past 2 years reduced the rates of gain considerably thereby delaying movement of hogs to slaughter. While another harsh winter could again reduce slaughter, especially in the first quarter, a mild winter could serve to increase pork production over a year earlier even more.

Continued low beef supplies will be one of a few positive factors affecting hog prices in 1980 but broiler supplies will be large during the first half of the year. We hope we have adequately accounted for the influence of the expected recession on demand. However, steady to somewhat lower hog prices than we are seeing now seem likely through mid-1980 because of both a weak demand and further increases in supplies. Fourth quarter barrow and gilt prices are averaging \$33-\$35. Barring severe winter weather—which might limit pork production enough to increase hog prices several dollars—a slight increase from the fourth quarter price (perhaps a dollar) seems most likely for the first quarter of next year.

Second quarter hog prices (April-June) probably will decline another \$4 from the first quarter to a \$30-\$32 average. The expected pork supply, if realized, will be near record large next spring and the recession-weakened demand would also be at a seasonal low.

How will this affect producer profits? Most producers will not cover direct costs (feed, labor, interest, other production items, and farm overhead). For farrow-to-finish producers we estimate direct costs per hundred pounds of hogs sold at:

\$35 to \$37 for the fourth quarter;

\$37 to \$39 for the first half of 1980.

Producers thinking about expanding their hog production facilities or new entrants to hog production must assess returns versus total costs which include ownership, management and other fixed costs in addition to direct costs. Through mid-1980 the total cost of hog production is expected to be in the mid-\$50's per hundredweight of hogs sold.

NEXT SUMMER AND FALL OUTLOOK

With the exception of late spring farrowings, the supply of slaughter hogs for July-December 1980 will come from sows and gilts already bred. Farrowings intentions recorded on September 1 for this December through February were 10 percent over a year earlier. Costs and returns during the breeding period were conducive to expansion. Data on sow slaughter through the end of September, do not indicate any major liquidation of sows during the breeding season just concluded.

Some reduction in the 1980 March-May pig crop is likely compared with this year if prices continue in the low \$30's for the next few months.

Pork production in the last half of 1980 probably will run 2 to 5 percent over that of this year. This will represent a substantial quantity of pork (an annualized per capita consumption of almost 77 pounds compared with 74 pounds this year) but the rate of increase over a year earlier will be slowing.

Hog prices for the last half of 1980 could improve to the upper \$30's if demand improves as we work our way out of recession.

THE LONGER TERM

Let us consider some longer run developments in the structure of hog production. Producing units with an inventory of less than 100 hogs still comprise just over three-fourths of all production units while those with an inventory of over 500 head are less than 4 percent—but the number of hogs produced in larger units continues to increase.

	Percent of hog production	
	1977	1978
Hog inventory (head):		
1 to 99.....	18.9	17.8
100 to 499.....	45.8	45.1
500 and over.....	35.3	37.1
Total.....	100.0	100.0

Our production economists feel that this year at least 40 percent of total hog production came from units having annual sales of 1,000 head or more. In 1974, this statistic was 24 percent. This upward trend is expected to continue.

More of the current expansion has taken place outside of the "heart of the hog country"—Iowa and Illinois—which has about one-third of the hogs. The June hogs and pigs report showed a 13-percent increase in the number of hogs in Iowa over a year earlier and an 11-percent increase for Illinois. Consider the year-to-year expansion in hog numbers as of last June 1 in other areas:

	Percent
Eastern Corn Belt:	
Indiana	+22
Ohio	+28
Southeast:	
Georgia	+37
Kentucky	+27
Western Corn Belt:	
Nebraska	+25
South Dakota.....	+25
Missouri	+21

These seven States had almost the same number of hogs as Iowa and Illinois on June 1, but the rate of expansion in these States was substantially greater.

Regardless of location, much of this growth is the result of construction of capital-intensive units. This will lead to a more concentrated industry that will tend to operate near capacity in order to spread overhead costs.

The price-production cycle for hogs was first analyzed in 1878, using data commencing with the Civil War. Actions which the industry might take to smooth the hog cycle have been the subject of research ever since. Recent research has focused on the notion of a "steady-state" livestock production industry, in which production is geared to longer run estimates of consumer demand thereby reducing the amplitude of the production cycle.

Let me close with a brief description of a "steady-state" level of hog production—a concept which could be achieved if hog production tends to larger, more concentrated units.

Pork demand at profitable producer prices has been projected at about 65 pounds per person in 1980 and 60 pounds per person by 1990—a slight downtrend. Recall we expect a 76-pound per capita consumption next year, and we reached a low of 56 pounds in 1975. But increasing population would offset this decline in per capita pork demand during the 1980's, resulting in a rather stable consumption and subsequent pork production. Unless productivity per sow increases markedly, we would need about $12\frac{1}{2}$ million sows farrowing each year throughout the 1980's to satisfy projected consumer demand. Compare this level of farrowings with 1979's which will be near $14\frac{1}{2}$ million, about the same number of farrowings are expected in 1980. Farrowings in 1975, the year of 56 pounds per capita consumption, were 9.9 million head.

UNITED STATES AND WORLD OUTLOOK FOR DAIRY

(By Charles N. Shaw, Agricultural Economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

The year of 1979 has been a good year for the dairy industry—a year in which higher milk production was offset by a combination of strong gains in commercial use of milk and dairy products, and the rebuilding of commercial dairy stocks from the low levels of late 1978. Consequently, it was a year in which market forces were the primary factors responsible for higher milk prices. So Government purchases under the price support program have been relatively small.

Ponder that for a moment—before I switch to 1980. Potentially 1980 presents a very different type of situation with uncertainty prevailing. Several developments that affect the supply and use estimates for dairy have taken place recently. Production is coming on stronger than previously estimated, and demand appears to be taking on a weaker tone. The bleak outlook for the performance of the general economy in early 1980 suggests some weakening in the demand for dairy products. There is much concern over the general economic outlook and how this will affect dairy prices and use. Let's attempt to sort it out.

MILK PRODUCTION MOVES HIGHER

Milk production began to increase in June, following 9 consecutive months of production near year-earlier levels. Total milk production in 1979 likely will be around 123½ billion pounds—about 1¼ percent above 1978. This annual increase is primarily due to strengthened output during the second half of this year.

Output per cow held fairly close to year-earlier levels during the first half of the year—even though milk-feed price relationships were consistently better than last year's favorable readings. However, during the July–September quarter, output per cow strengthened sharply, and averaged about 2¾ percent above the same period of both a year earlier and 2 years earlier. This was enough to bring output per cow during the first 9 months of 1979 up about 1¾ percent, more than offsetting the slower average decline in cow numbers.

Monthly declines in milk cow numbers from a year earlier have been small thus far in 1979—ranging only from 0.6 to 0.9 percent—despite higher cull cow prices. These rates compared with declines of from 0.9 percent to 1.4 percent during the same period in 1978, and were comparable to the declines of the 1975–77 period. Apparently, the major adjustments (in culling and dispersals) due to high cull cow prices were made last year. The prospects for less favorable off-farm employment opportunities has probably been another important factor in these smaller declines, as has the large supply of replacement heifers.

Milk production in July–September was about 2 percent above a year earlier, following an increase of less than one-half of 1 percent during the first 6 months of the year. Over 75 percent of the total U.S. third-quarter gains in production occurred in the two leading States in milk production—in Wisconsin where pasture conditions have been near ideal for producing milk, and in California where cow numbers are increasing and output per cow is recovering from very weak levels last year. Among the other leading dairy States, third-quarter output was up 3 percent in New York—accounting for 12 percent of the total U.S. increase—while production in Minnesota and Pennsylvania was unchanged. On a regional basis, production during the first 9 months of 1979 has registered gains of 3 percent in the Pacific region, gains of 1–2 percent in the Northeast, Lake States and Mountain regions, with no change to lower production reported in the remaining regions.

Farmers reportedly fed almost 7 percent more concentrates on October 1 this year than in 1978. Dairy ration costs in October were well above the moderate levels of a year earlier and likely will average slightly higher during the barn feeding season. Expected higher milk prices probably will be largely offset by the higher feed prices during the coming year. While the record soybean crop will put downward pressure on high protein meal prices, strong demand will keep corn well above 1979.

Nevertheless, milk-feed price relationships still should be favorable for dairy farmers in 1980, although likely not as favorable as in 1979, the milk-feed price ratio—pounds of 16 percent protein ration equal in value to 1 pound of milk—stood at 1.54 in September, down slightly from a year earlier. Alfalfa hay prices in September were sharply above last year's low level although this year's estimated production is only slightly below last year.

PRODUCTION INCREASES TO CONTINUE INTO 1980

Milk production probably will remain well above year-earlier levels at least through mid-1980. It now appears likely that first-half 1980 milk production will be up about 1 to 1½ percent. Still favorable milk-feed price relationships could result in continued heavy concentrate feeding and a continuation of sizable increases in output per cow. Conversely, slaughter cow prices probably will remain high and exert pressures for continued declines in cow numbers.

Milk production later in 1980 will depend on the impact of 1980 crop conditions on feed prices, the rate of increase in other production costs, and the impact of economic conditions on demand and thus on milk prices. All considered, milk production in 1980 is expected to total about 1 percent more than the 1979 figure of about 123½ billion pounds. However, it is still early, and developments in economic conditions, weather conditions, or market forces could alter this outlook in either direction.

PRICE INCREASES TO CONTINUE IN 1980

During most of this year market forces (not the support price) were the primary factors affecting farm milk prices as the higher milk out-

put was offset by strong gains in commercial use and the rebuilding of commercial stocks from the low levels of later 1978. The resulting tight supply-demand balance brought prices up seasonally during the summer and early fall. Farmers received an average \$12.30 per 100 pounds of milk in September, up 13 percent from a year earlier and up 7 percent from the spring low. Manufacturing grade milk prices (adjusted for fat test) in September were 67 cents above the support price for April-September, and only 6 cents below the support price which became effective on October 1. Farm milk prices in 1979 probably will average about 14 percent higher than in 1978. These higher prices and larger marketings likely will push cash receipts from dairying past \$14½ billion, up from \$12.7 billion in 1978.

In early 1980, milk prices will ease seasonally as the increased production, relatively high level of commercial stocks at the start of the year, and weakening demand push prices down to the support level earlier than in 1979.

If 1980 milk output and commercial use develop as expected, purchases under the price support program could be substantially above this year's small totals, and manufacturing grade milk prices would average much closer to the support level in the coming year. Farm prices of all milk probably will average 9 to 11 percent higher than in 1979, with the largest gains during the second half. A substantial year-to-year rise is assured by the higher support prices (which must be adjusted on April 1) but potential further price increases will be limited by large USDA stocks of butter and nonfat dry milk and the current 105 percent sell-back policy. Even with the expected higher prices, increases in dairymen's returns over concentrate costs probably will be smaller than in 1979 but still should cover rises in other costs.

By late October, wholesale American cheese prices were about 7 to 8 cents per pound higher than last spring, while butter prices were 8 to 10 cents higher. Nonfat dry milk prices had risen about 5 cents per pound since spring. Some limited increases are possible in coming weeks, but wholesale prices will be sensitive to potential changes in either the supply or the demand side of the picture.

Retail dairy prices rose throughout the first 3 quarters of 1979, and the increases from a year earlier generally have been slightly larger than the average increases in all food prices. For all of 1979, retail dairy prices probably will average about 11 percent higher than 1978. Prices of milk and dairy products in grocery stores will increase again in 1980, although the rate of gain likely will be less than this year—perhaps in the range of 8 to 10 percent. This would be about the same as the expected increase in all food prices.

COMMERCIAL USE TO BE STEADY IN 1980

Despite rising prices, commercial use of milk and dairy products has remained strong this year. During the first 8 months of the year commercial use posted an increase of almost 11½ percent from the year-earlier levels. The year-to-year increase was buoyed by strong sales of other-than-American type cheese, up about 6 percent from last year's strong sales. Sales of American cheese and butter were also up 2 and 3 percent, respectively. Fluid milk sales and ice cream were about the same as last year while cottage cheese and nonfat dry milk use were

both down. Total commercial use during the last 4 months of 1979 probably will be close to a year ago. If this is the case, total commercial use for the year would exceed 120 billion pounds and would top last year's record by about 1 percent.

Sales of dairy products next year should be at or near 1979 levels, but somewhat below the trend increase of about 1 percent. However, sales could be greater if the impacts of the expected recession are less severe than now anticipated, or if meat supplies are below expectations.

COMMERCIAL DAIRY STOCK UP

Commercial stocks of dairy products have been well above last year's relatively low levels since May. Through mid-1979, they were being rebuilt from the very low levels of late 1978. Since June, increased milk production and seasonal additions to stocks contributed to the increase in commercial holdings. Anticipation of the new support prices which became effective October 1 likely was also a factor. October 1 holdings of both milkfat and solids-not-fat are estimated to be up over a fifth from last year. Commercial stocks of butter were up about 76 percent from the previous year, while commercial holdings of nonfat dry milk are estimated to be up by about a half. Commercial stocks of American cheese and other-than-American varieties were up 17 and 10 percent, respectively.

Even if commercial use holds as anticipated this fall, commercial stocks will still be large at the start of 1980. However, with short term interest rates sharply higher in recent weeks, some additional sales to CCC (not specifically related to supply-demand conditions) could occur as the industry aligns stock levels with expected sales—taking into account storage costs and CCC sell-back policy. While USDA stocks of butter and nonfat dry milk remained large on October 1, both were down about a fourth from a year earlier.

USDA PURCHASES SMALL IN 1979; LIKELY TO INCREASE AGAIN

USDA purchases under the price support program were small through the first 9 months of 1979. Through September, CCC net removals totaled about 56 million pounds of butter and 12 million pounds of cheese for a milk equivalent total of only 1.3 billion pounds, down over a half from the same period last year. Proportionately more nonfat dry milk than butter was purchased, but the 187 million pounds purchased were nearly a third less than the same period of 1978.

The CCC purchase picture may be changing, however. CCC purchased all three products—butter, cheese, and nonfat dry milk—during October. Last year during October only small amounts of nonfat dry milk were purchased, while butter was sold back to the industry for unrestricted use.

With milk production increasing, continued increases likely, and a recession likely to have an impact on sales in coming months—there will be sharp increases in CCC removals from this year's low level. While CCC removals in 1980 are not expected to approach the high levels of 1977, per unit support prices are higher. Therefore, the increase in costs associated with any increase in net removals will be proportionately greater than the increase in removals.

IMPORTS STEADY

For the first 8 months of 1979, total imports were down 3 percent on a milk equivalent, fat solids basis. Because of continuing higher domestic dairy product prices and the existence of much room under the quotas for most covered products, total 1979 imports are expected to about equal those of 1978.

Total cheese imports declined slightly over the January–August period this year compared to last year. Decreases in imports of non-quota type cheeses were offset by larger imports of cheese subject to quotas. The increased offerings of quota types were due mainly to larger imports of “pricebreak” varieties entering at prices less than 7 cents per pound above the American cheese support prices and were thus subject to quota. All types of quota cheeses were well under the 1979 calendar quotas, although the last quarter of the year historically accounts for 40 percent of cheese imports.

Among other dairy products subject to quotas, butteroil and nonfat dry milk were the only dairy products whose calendar year quotas were filled or came close to being filled as of September 1. With respect to nonquota products, case in imports were up 8 percent during the first 8 months of the year, while lactose decreased by over 50 percent.

The Trade Agreements Act of 1979, which implements the results of the Tokyo round of multilateral trade negotiations, is expected to increase U.S. agricultural exports substantially. The act authorizes the expansion of cheese import quotas to 245 million pounds beginning calendar year 1980 from the current level of 128 million pounds. (Actual 1978 imports totaled 242 million pounds.) In addition, it brings under absolute quotas most of the so-called pricebreak cheeses which previously have been free from quota. Also under the act, foreign nations are allowed to subsidize exports into the United States without the imposition of a counted action, as long as the prices of such imports do not undercut prices of domestically produced cheese of similar type.

WORLD MILK PRODUCTION

Increased milk production in the European Community (EC), the United States, and Oceania is expected to outweigh a substantial decline in the Soviet Union (the world’s largest milk-producing nation). This will result in slightly higher world milk production in 1979.

European Community total milk production for the first 8 months of 1979 was up over 2 percent from last year, and is expected to be about 2 percent larger for the entire year. Despite downward pressure on cheese prices, cheese production in the European Community this year is greater. Year-end stocks are expected to be about the same as a year earlier as demand from other countries has been high. Butter production also increased over the first two-thirds of 1979, and European Community intervention stocks of butter on September 1 were 25 percent greater than in 1978. Nonfat dry milk output has declined this year, however, increased sales to nations outside the European Community and continued subsidies for use in animal feed within the European Community have been largely responsible for reducing intervention stocks to less than half of those held a year earlier.

Among other West European nations, milk production increased at rates similar to those in European community countries. Despite increased cow numbers, milk production in Eastern Europe and the Soviet Union is down about 3 percent this year, as a shortage of good quality animal feedstuffs remained. Roughage supplies apparently were also less than adequate.

Both Australia and New Zealand posted substantial gains in milk production in their respective dairying years recently concluded. Cheese manufacture expanded dramatically in both countries as they continue to adjust their product mix since losing a part of their major export market for butter when the United Kingdom joined the European Community. Canadian milk production in 1979 has fluctuated around year-earlier levels while cheese production is substantially higher. Japan, now an important milk producer, continues to expand milk production above a year ago.

Worldwide surpluses of milk and milk products still persist, partly due to improved genetics and feeding practices. This has resulted in production increasing faster than the worldwide use of dairy products. In general, countries with supported dairy economies outside the European Community have had modest success in slowing or cutting production gains. Several countries have done so by imposing quotas and penalties for over quota production. Norway has paid bonuses to producers to cut back production, while in Australia, policy was aimed at decreasing butter production in favor of cheese production to reduce dairy product stocks. Japan, with its dramatic milk production gains of the last few years, is now facing the milk oversupply situation.

The European Community offered incentives to producers to not market milk or to convert to beef production as a means of checking production, but the program has had less impact than expected.

SUMMARY

World production next year will continue to exceed use and worldwide surpluses of milk and milk products will persist. In the United States, the next year probably will see higher milk production and steady commercial use. Prices will again be higher in 1980, but likely will be mostly offset by higher feed costs and rising production costs other than feed. If U.S. production strengthens more than expected and/or demand weakens more than expected, 1980 could again see the return of relatively large dairy product surpluses.

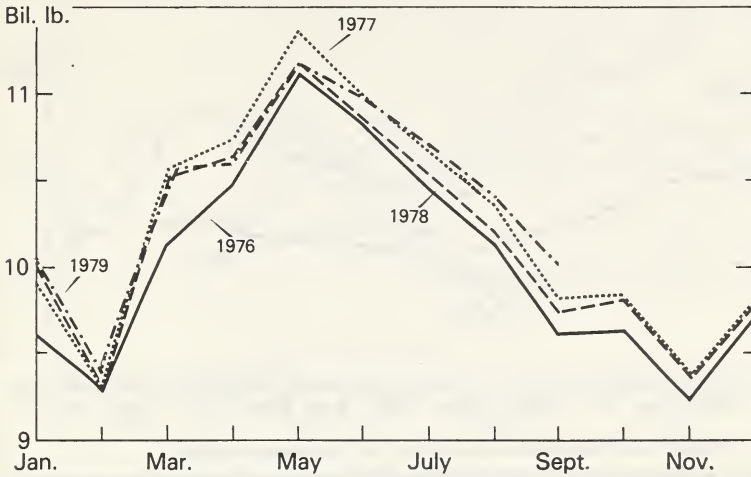
TABLE 1.—DAIRY SUMMARY, 1977-79

Item and unit	1977	1978	1979	Percent change, 1978-79
Annual ¹				
Milk production (billion pounds).....	122.7	121.9	123.4	+1.2
Milk per cow (pounds).....	11,181	11,240	11,465	+2.0
Number of cows (thousands).....	10,974	10,848	10,765	— .8
Milk prices received by farmers (hundredweight).....	\$9.72	\$10.58	\$12.05	+\$13.9
Manufacturing grade (hundredweight).....	\$8.70	\$9.65	\$11.15	+\$15.5
Cash receipts (millions).....	\$11,752	\$12,722	\$14,675	+\$15.4
Value of dairy rations (hundredweight).....	6.20	6.07	6.60	+\$8.7
Milk-feed price ratio (pounds).....	1.39	1.53	1.57	+2.6
Utility cow prices, Omaha (hundredweight).....	\$25.32	\$36.71	\$50.10	+\$36.5
January–September				
Wholesale prices (cents per pound):				
Butter (Chicago, grade A).....	97.55	106.85	120.03	+12.3
American cheese (Wisconsin assembling points, 40-lb blocks).....	96.08	103.66	122.85	+18.5
Nonfat dry milk (manufacturers' average) ²	65.78	69.94	78.46	+21.2
Dairy products (BLS) (1967=100).....	172.2	184.6	208.6	+13.0
USDA net removals (millions of pounds):				
Butter.....	209.3	122.1	56.3	–53.9
American cheese.....	146.3	39.7	12.1	–69.5
Nonfat dry milk.....	393.0	269.7	187.2	–30.6
Evaporated milk.....	11.5	13.0	12.8	–1.5
Milk equivalent.....	5,793	2,942	1,311	–55.4
January–August				
Retail prices (BLS): ³				
All foods (1967=100).....	190.7	208.4	232.2	+11.4
Dairy products (1967=100).....	172.7	182.1	203.4	+11.7
Manufactured products output:				
Butter (million pounds).....	755.0	715.6	688.7	–3.8
American cheese (million pounds).....	1,459.5	1,449.4	1,515.5	+4.6
Other cheese (million pounds).....	860.9	944.6	1,004.2	+6.3
Nonfat dry milk (million pounds).....	815.5	716.2	664.1	–7.3
Canned milk (million pounds).....	599.8	554.1	548.0	–1.1
Cottage cheese (million pounds).....	602.1	599.5	582.6	–2.8
Ice cream (million gallons).....	567.3	569.5	572.0	+ .4
Ice milk (million gallons).....	224.5	223.0	211.8	–5.0
Imports of dairy products:				
Total milk equivalent (million pounds).....	1,120	1,261	1,225	–2.9
Commercial disappearance:				
Total milk (million pounds).....	75,854	78,869	80,048	+1.5
Butter (million pounds).....	519.2	581.6	599.5	+3.1
American cheese (million pounds).....	1,253.0	1,380.2	1,403.5	+1.7
Other cheese (million pounds).....	965.0	1,051.5	1,111.0	+5.7
Canned milk (million pounds).....	502.4	483.3	475.2	–1.7
Nonfat dry milk (million pounds).....	449.1	442.7	418.5	–5.5
Cottage cheese (million pounds).....	602.1	599.5	582.6	–2.8
Ice cream (million gallons).....	567.3	569.5	572.0	+ .4
Ice milk (million gallons).....	224.5	223.0	211.8	–5.0
Average daily sales in urban markets:				
Fluid whole milk.....				–2.5
Fluid low-fat milk.....				+4.3
Cream and cream mixtures ⁴				— .4
Total fluid products.....				+ .1

¹ 1979 estimated.² January–August.³ For all urban consumers starting January 1978.⁴ January–July.

CURRENT SITUATION CHARTS

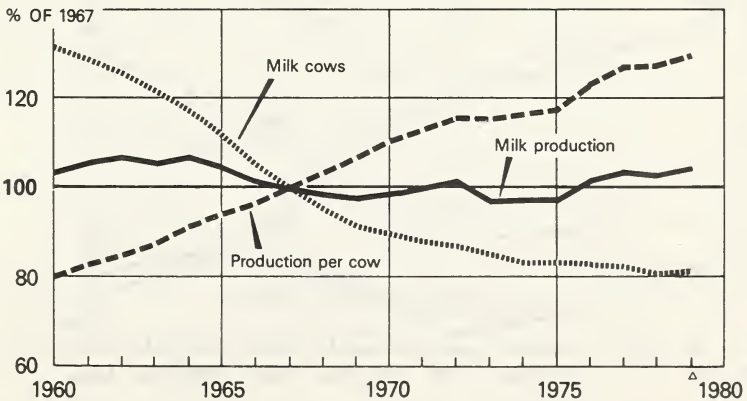
U.S. Milk Production by Months



USDA

Neg. ESCS 5498-79 (11)

FIGURE 1

MILK PRODUCTION, NUMBER OF COWS,
AND MILK PER COW

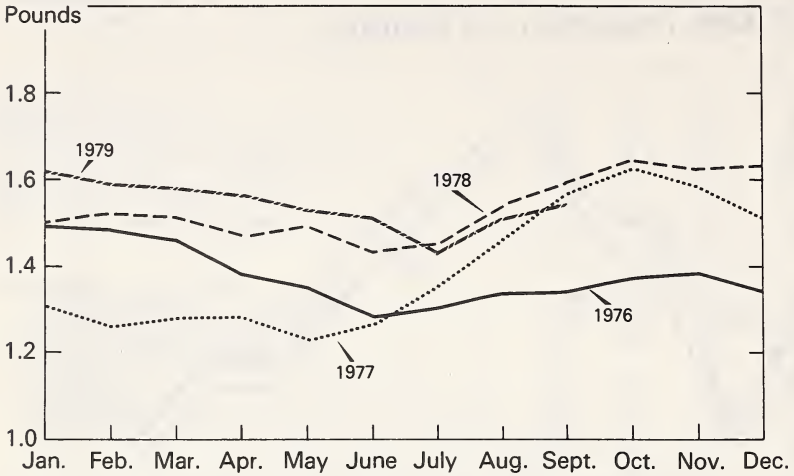
Δ FORECAST.

USDA

NEG. ESCS 2912-79 (11)

FIGURE 2

Milk-Feed Price Ratio*



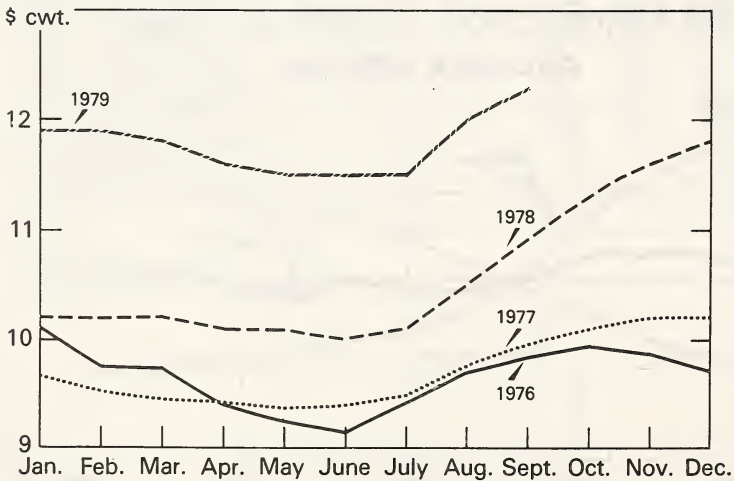
*Pounds of 16% protein ration equal in value to one pound of milk sold to plants and dealers.

USDA

Neg. ESCS 40-79 (11)

FIGURE 3

Milk Prices*



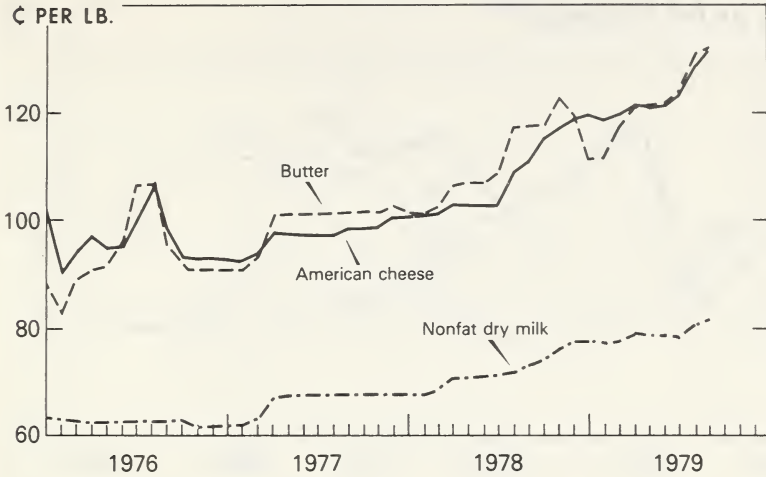
*U.S. average price received by farmers for deliveries to plants and dealers.

USDA

Neg. ESCS 5449-79 (11)

FIGURE 4

Wholesale Dairy Product Prices

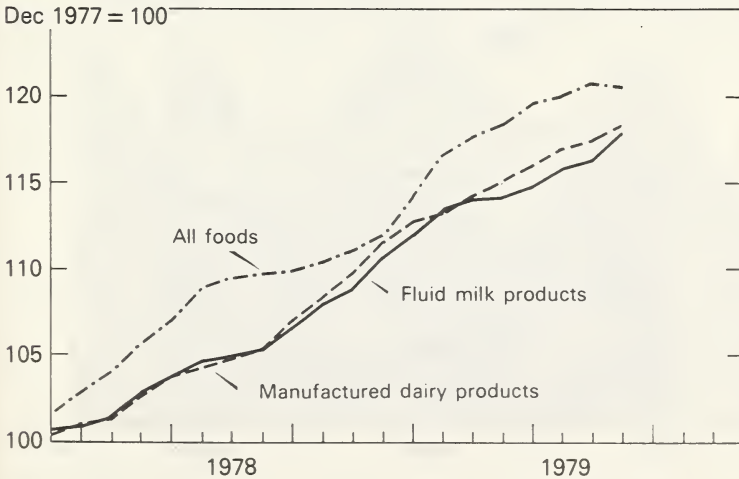


USDA

Neg. ESCS 39-79 (11)

FIGURE 5

Retail Food And Dairy Product Prices

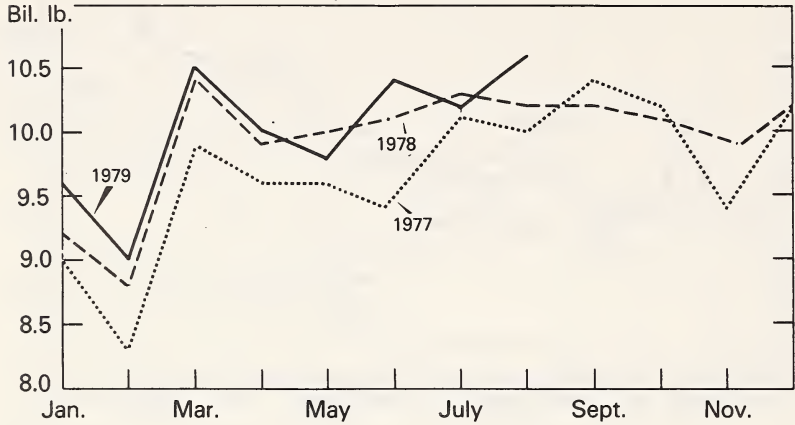


USDA

Neg. ESCS 38-79 (11)

FIGURE 6

Commercial Disappearance of Milk in All Products*



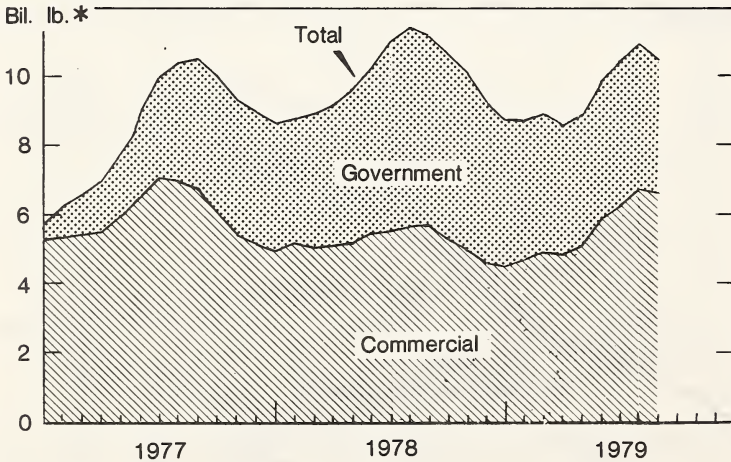
*Milk equivalent.

USDA

Neg. ESCS 2075-79 (11)

FIGURE 7

Dairy Product Stocks[○]



[○]As of first of month

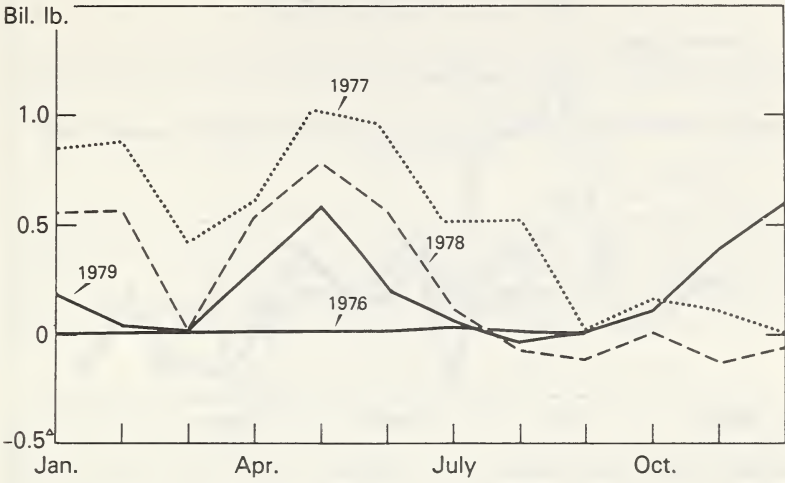
Milk equivalent, fat-solids basis.

USDA

Neg. ESCS 8448-79 (11)

FIGURE 8

USDA Dairy Product Purchases*



*Net removals, milk equivalent, fat-solids basis.

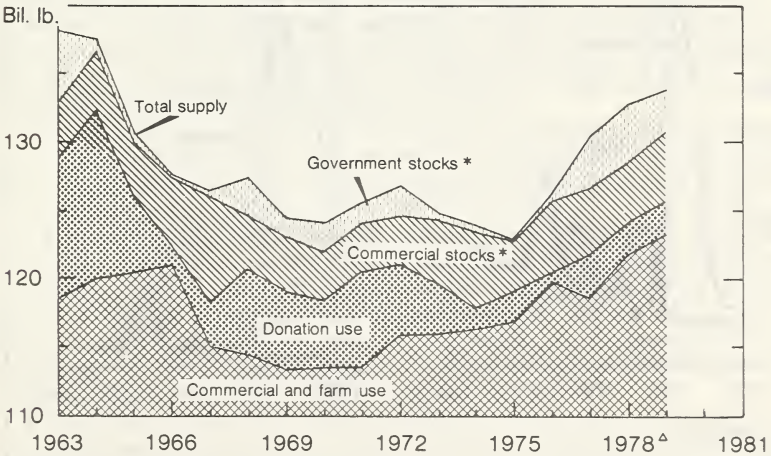
△ Negative figures denote domestic sales exceeded purchases.

USDA

Neg. ESCS 8449-79 (11)

FIGURE 9

Milk Supply, Use and Carryover



* As of December 31.

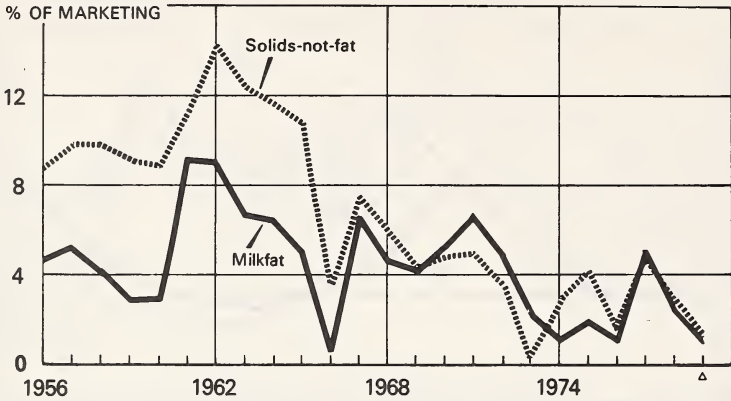
△ Forecast

USDA

Neg. ESCS 3523-79 (11)

FIGURE 10

MILK SOLIDS REMOVED FROM THE MARKET BY CCC PROGRAMS*



*DELIVERIES AFTER DOMESTIC UNRESTRICTED SALES.

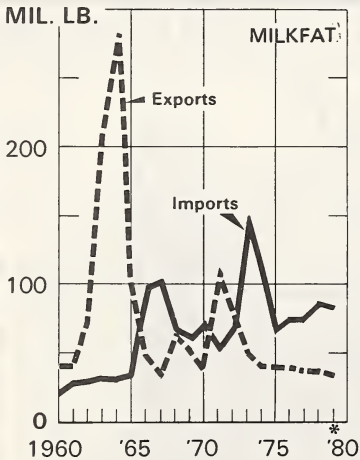
Δ FORECAST.

USDA

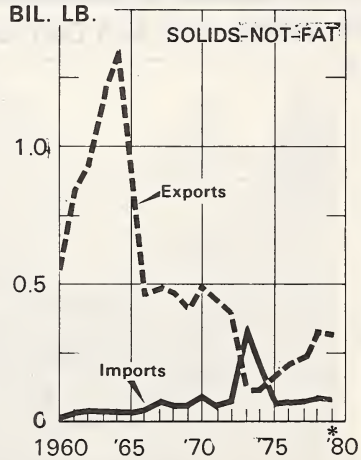
NEG. ESCS 5313-79(11)

FIGURE 11

DAIRY IMPORTS AND EXPORTS



* FORECAST.



USDA

NEG. ESCS 2911 79(11)

FIGURE 12

PERSPECTIVES OF STRUCTURE IN THE FARM SECTOR

(By Emerson M. Babb, Department of Agricultural Economics, Purdue University)

The importance of the structure of American agriculture has been described in a series of issue papers prepared by USDA. I concur with the reasons for the importance of this subject. The structure of the farm sector will receive a great deal of attention for some years to come.

IMPORTANCE OF OUTLOOK FOR FARM STRUCTURE

Since this is an outlook conference, I want to stress the importance of outlook information about the future structure of the farm sector. Information about farm structure 5 to 20 years in the future is critical to numerous and varied longer run decisions. Let me provide some examples.

A machinery firm may need 3 to 5 years to design and produce new types and sizes of equipment which are targeted to the needs of specific types and sizes of farms. Large research and development investments may be associated with the new equipment. Unanticipated changes in farm structure could result in a limited market for such equipment and produce economic losses for the firm, and for society.

A grain elevator may be constructed with the expectation that direct purchases will be made from farmers during the useful life of the elevator. If grain production declines in the area, or if farmers enter into contractual arrangements which bypass the elevator, its construction may have been a mistake. A failure to foresee change in farm structure was the cause of the poor decision.

Both examples illustrate the need for firms selling inputs to farmers, or buying commodities from farmers to have accurate projections about the customers they will serve in future years. This involves a projection of structure in the farm sector.

Farmers likewise make longer run decisions about their businesses. Projections of structure and factors which will affect structure are as important to them as to firms with whom they do business. For example, the type of sales arrangement and availability of market outlets in the future may influence enterprise selection and related investment decisions. The rate of exit from farming could influence the availability of land, which would bear on the decision to expand.

In short, projections of farm structure during a 5- to 20-year horizon are extremely important to many groups, including policymakers. Much of our outlook information is for the shortrun (1 year) and many of our research projections are for the very longrun (the year

2000 and beyond). Perhaps we should devote more effort to intermediate-run outlook concerning farm structure. After all, the accumulation of farm structure changes over time shapes the shortrun outlook.

CONSEQUENCES OF PAST STRUCTURAL CHANGE

Many of our past policies and programs were directed at correcting resource imbalance in agriculture. These programs, coupled with other economic forces, have produced a situation of near equilibrium for resources in agriculture currently. In the process of reaching this resource equilibrium, the structure of the farm sector has undergone dramatic change.

Some of the benefits that have been obtained over time from greater farm concentration and specialization include:

Higher incomes for remaining farm families;

Greater wealth for remaining farm families and for other resource owners;

Lower food prices for consumers than would otherwise have prevailed, and a smaller proportion of total disposable income spent for food;

The release of agricultural labor which has been used in the production of other goods and services;

Increased export earnings which have ameliorated our balance-of-payments problem;

Abundant supplies of food and fiber.

These benefits have not been obtained without cost. Some of the costs of changes in farm structure include:

Greater risk facing farmers, especially in the absence of Government programs which transfer risk;

Coordination arrangements which foreclose outlets and methods of exchange;

Stress on farm families forced to migrate from agriculture and increased social costs of assimilating some displaced persons;

Some deterioration of rural communities, especially where non-farm related industries are not available to take up the slack;

Greater degradation of the environment from the expanded use of fertilizers, chemicals, and more intensive land use;

Greater reliance on purchased inputs which are becoming more costly, subject to supply disruptions, and subject to allocations to alternative uses, for example, water and energy;

More difficulty in achieving equity with farm programs, given the growing diversity in agriculture.

The costs and benefits of past changes in structure have not fallen evenly on individuals or groups in our society. Nevertheless, I suspect that the consequences of past changes in farm structure would receive a positive consensus evaluation. The important question now concerns the balance of costs and benefits of future changes in farm structure. Depending on the assessment of consequences of future farm structure which will evolve from current policies, the public may want to modify the course of farm structure developments. For example, the public may want to accelerate or decelerate the trend of greater farm concentration.

INFORMATION NEEDED ABOUT FARM STRUCTURE

A huge amount of information would be useful for decisionmaking about policies affecting farm structure, in fact more than will ever be available. Decisionmakers will have to use a mixture of judgment and research findings in establishing policies. Basically, we need to quantify the impacts of factors which affect structure, and to measure the consequences which flow from alternative structures. For example, how would the number and size distribution of farms be affected by a more severe limitation on program benefits to farms above a certain size? What would be the consequences of any changes in structure, such as farm income, land prices, food prices, and the cost of government programs? These and other farm structure related questions will be difficult to answer. But, the choice of farm structure will be made on the basis of facts or perceptions about the consequences flowing from alternative structures.

Fortunately, we have some stock of research findings relating to farm structure. The USDA issue papers summarize much of what is known about farm structure. Beyond this, a good bit of research on farm structure has been initiated, and research interest in the topic should expand. Let me illustrate information which is needed about farm structure with three examples.

Economies of size

Economies of size are one important determinant of the number and size distribution of farms and of the degree of specialization. Research findings on current technical and pecuniary economies for different types of farms are in short supply. This information is essential in measuring the economic gains and losses associated with encouraging a particular farm size. We must recognize that the size of farm which can capture available economies of size will change over time. In the past, changes in technology have greatly increased the size of farm which is necessary to capture available economies. This point raises the question as to whether more of our research and development efforts should be directed toward technologies for smaller farms.

Changes in input price relationships

Energy provides a good example of an input whose price has dramatically increased relative to prices of most other inputs. As farmers adjust to higher energy prices, will farm size, organization, production methods, and technologies employed be changed? Will there be regional shifts in production? It is possible that farmers' adjustments to higher energy prices may have as much impact on farm structure as changes in farm programs. Thus, to project farm structure, we need estimates of energy prices, as well as farmers' adjustments to those prices. The same applies to other inputs, and to commodity prices.

Exchange arrangements

Exchange arrangements affect ownership, control, and coordination in the food system. There is research which suggests reasons for the emergence of new exchange arrangements such as contracting, and the consequences of these arrangements. Development of new exchange arrangements is difficult to project because incentives and innovators must be identified. An innovator envisions an exchange arrangement

that would be beneficial to the firm. Benefits may be growth in sales, reduction of risk, greater stability in earnings, as well as higher profits. The new exchange arrangement must provide benefits to other parties at least equal to those under the current arrangement if its use is to become widespread.

An exchange arrangement which offers benefits to all parties could become widely used without being the arrangement which would provide maximum total benefits. For instance, contracting in the broiler industry as undoubtedly generated many benefits. However, this does not necessarily mean that all other exchange arrangements are inferior. If the public wants to influence exchange arrangements in agriculture, we need to determine the consequences of alternative arrangements for various groups, as well as the aggregate consequences. It is likely that exchange arrangements which may be preferred by the public would vary among commodities. Of course, not all firms in a particular commodity sector will prefer the same exchange arrangement. At present we can say very little about the consequences of alternative exchange arrangements for any group.

While consumers are not parties to exchange arrangements in the farm sector, we should recognize that they are affected by the exchange arrangements which are used. Exchange arrangements and other dimensions of farm structure affect the level and stability of food prices, product quality, variety and uniformity, use of natural resources, and Treasury costs for farm programs. Consumers have an important stake in the farm structure issue. Their interests will be given recognition.

POLICY TOWARD FARM STRUCTURE

There is an urgency about the need to obtain information which can be used in formulating policies which influence farm structure. But, we are not in a farm structure crisis. While structure can change dramatically during 10 to 20 years, the changes from 1 year to the next are small. We are thus fortunate in having time to obtain additional information which can guide policy formulation and to reach some consensus about farm structure issues.

This situation suggests an interim period of neutrality toward farm structure. At first blush, this might appear to be a fiddling-while-Rome-burns approach, but it is not. Such a position would involve a change in many current policies and programs which have not been neutral with respect to farm structure. For example, it appears that farm programs, tax provisions, credit policies, and research programs have had the effect of accelerating concentration in the farm sector. Perhaps a farm structure impact statement on new policy proposals would be useful. This would provide decisionmakers with some assessment as to whether the proposal was neutral with respect to farm structure.

If the public wants to modify farm structure over time, based on expectations about consequences associated with alternative structures, it appears that policies could be adopted which would have this effect. Farm structure has been projected under various assumptions about exogenous factors and policy changes which would accelerate or decelerate concentration in the farm sector, compared to continuation

of current policies. If current policies remain intact, the trend toward greater farm concentration will continue, but at a somewhat slower pace than during the last decade. Policies which would further accelerate farm concentration might result in 40 percent fewer farms by the year 2000, as compared to conditions resulting from no change in policy. Policies which would decelerate concentration might result in 20 percent more farms, as compared to conditions resulting from continuation of current policies. It should be noted that even under this scenario, there would be fewer farms than at present. If these projections are correct, our choice of public policies can have fairly significant impacts on the future structure of American agriculture.

1980 OUTLOOK FOR TOBACCO

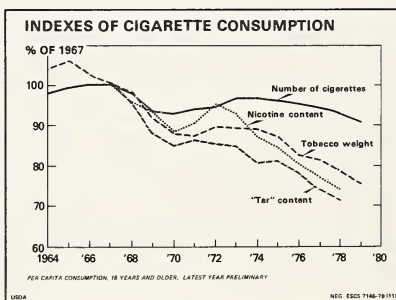
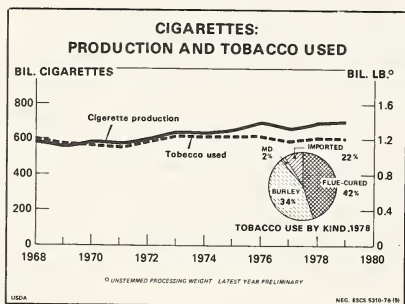
(By Robert H. Miller, Agricultural Economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

The U.S. tobacco outlook for 1980 is highlighted by moderate export demand and gradually declining domestic prospects. The weather-reduced crop this year falls short of prospective use, but carryover stocks are ample. This season's marketings are falling short of quotas so quota carryover into 1980 means next year's Flue-cured and burley crops may increase. Greater production and higher support prices indicated for next year mean cash receipts may rise.

CIGARETTE SALES STABILIZE

Cigarettes dominate the tobacco industry here in the United States, and in most other countries. U.S. cigarette output should reach a record of 705 billion pieces this year, about 2 percent above 1978. The increase will result from sharply rising exports as domestic sales have stabilized. Sales of low tar cigarettes—15 milligrams of tar or less—are steadily gaining, offsetting declines for other categories.

The continued increase in the smoking age population is matched by the decline in cigarettes per capita. Cigarette consumption per person, 18 years and over, may decline again in 1979, to around 195 packs or 3,900 cigarettes. Measured in terms of nicotine content, "tar" content, and tobacco weight, per capita consumption has declined at a faster rate than indicated by the number of cigarettes.



Antismoking publicity and legislation continue to increase. About two-thirds of the States and many cities and counties have enacted laws to either prohibit smoking in certain places or segregate smokers from nonsmokers. The U.S. Department of Health, Education, and Welfare, and voluntary health agencies continue their efforts to discourage smoking. The cumulative effect on total smoking is uncertain,

although it may account for some of the downtrend in per capita consumption.

Wholesale cigarette prices, wholesale-retail margins, and retail prices rose in 1979. A mid-year rise in wholesale prices and increasing wages for retail labor meant a 5-percent hike in retail cigarette prices for the year.

Four States raised excise taxes in 1979. Direct excise taxes vary from 2 cents per pack in North Carolina to 21 cents in Connecticut and Massachusetts and 23 cents in New York City. Last year's contra-band cigarette law is reducing sales of bootleg cigarettes.

Cigar and smoking tobacco consumption is trending downward. Consumption of large cigars in 1979 totals about 4.4 billion, 6 percent below 1978 and less than one-half of the 1964 peak. Also, small cigar consumption may fall one-fifth below the 1.6 billion total of 1978. Use of smoking tobacco in 1979 is down one-tenth to an estimated 40 million pounds, a record low. Next year, consumption may drop further.

Snuff output remains about the same. By contrast, chewing tobacco output probably will surpass 100 million pounds this year, 6 percent more than in 1978. This year's indicated total would be the largest since 1946. These tobaccos have gained from the shift from tobacco smoking and from stepped-up advertisement and promotion.

EXPORT QUANTITY DOWN: VALUE STILL RISING

The value of U.S. exports of tobacco and tobacco products in 1979 may gain one-tenth from last calendar year's record high to around \$2.3 billion. The value of unmanufactured tobacco exports may just match last year's record, but tobacco products will surge above last year's high level, with the continued boom in cigarette exports. In recent years, leaf and product exports have taken about four-tenths of the U.S. tobacco crop. This year U.S. tobacco exports will register about a \$1.8 billion surplus over tobacco imports of \$500 million. This favorable tobacco trade balance, along with strong sales of other agricultural products, is helping offset the U.S. trade deficit in nonagricultural products.

Unmanufactured tobacco exports in 1979 may fall one-tenth from the record high of 700 million pounds—804 million farm-sales weight—shipped last year. Crop quality is not as desirable this season; also, foreign buyers replenished their stocks last season. Foreign takings of leaf are held down by price and tax increases, along with increasing antismoking activities, that limit growth in world cigarette production to around 2 percent annually. Burley and Flue-cured, however, benefit from a growing preference for cigarettes containing American-type blends. In our major market, the European Community, imports of U.S. tobacco are one-sixth below 1978. Japan's imports will decline due to large supplies of local tobacco. However, purchases by other Asian markets continue to trend upward.

World tobacco output this year may total below the 12 billion pounds—5.58 million metric tons—produced in 1978, chiefly because of lower United States and Turkish output. Africa and South America's production rose. The long-term trend is for foreign Flue-cured and burley production to rise relative to the United States as manufacturers adapt their blends to these less expensive tobaccos.

Imports accounted for about 55 percent of U.S. manufacturers' tobacco utilization last year—22 percent for cigarettes and 55 percent for cigars and chewing tobacco. Oriental cigarette leaf is the principal kind imported but other kinds of leaf and scrap are increasing. Cigarette tobacco imports for factory use this year may jump to around 300 million pounds. This includes 100 million pounds of scrap and about 20 million pounds of Flue-cured and burley leaf. Cigar imports are mainly filler tobacco and for this year will probably total about the same as the 45 million pounds of last year.

TOBACCO CROP SMALLEST SINCE 1957

The most notable development for U.S. producers in 1979 was the cool, wet growing season that spawned by far the most destructive outbreak of field blue mold ever recorded. Yield and crop quality were reduced. Also, ASCS eliminated the stored tobacco carryover program for over-quota tobacco—Flue-cured and burley—so growers had to tailor their plantings closer to effective quota and thus acreage was reduced 10 percent.

Despite the one-sixth smaller crop and 7 percent higher support levels, relatively large loan holdings and weaker demand meant prices at Flue-cured auctions gained just 4 percent. So cash receipts are expected to total less for growers in 1979 due to the reduced volume. Higher input costs pushed cost budgets up about 7½ percent from 1978. Reduced yields raised the cost per pound even further.

Total tobacco production is down 17 percent this season. Adding the slightly larger carryover, total supplies for 1979–80 marketing year are down about 3 percent from last year. When burley markets open later this month, prices may rise to an all-time high, surpassing the 1978 season's record of \$1.31 per pound. The 1979 burley support level exceeds the 1978 market average, and the short 1979 crop is being supplemented with loan stocks. At the beginning of the 1979–80 marketing year, tobacco held under Government loan totaled 785 million pounds—farm sales weight—about 90 million above a year earlier. The moderate volume of loan receipts from this season's Flue-cured crop was offset by sales of older crops held in loan. Almost 30 percent of the old crop loan stocks are the less desirable priming tobacco—P-grade. In 1979 grower participation in the voluntary "4-leaf plan" and blue-mold disease severely restricted marketings of the P grades. But sales from loan remain negligible since prices of these tobaccos substantially exceed the cost of comparable filler tobaccos from other countries.

Government price support is mandatory for tobacco produced under marketing quotas. The legal formula requires that price support levels for eligible tobaccos go up about 9 percent next year over 1979. The increase results from a rise in the parity index—which is the measure of changes in prices paid by farmers, including wages paid to hired labor, interest, and taxes. Despite the steady price increases for production inputs, rising lease rates for Flue-cured allotments remain a major cause of concern.

For Flue-cured tobacco, the smaller crop and larger carryover mean a 5 percent smaller supply in 1979–80. This season USDA lowered the Flue-cured quota 2 percent to reduce supplies. With acreage reduced and yields hurt by unfavorable weather conditions, growers are selling about 15 percent less than in 1978.

The 1979 Flue-cured auction season has just ended with a record average of \$1.40 per pound, 5 cents above a year ago. Quality was off from the 1978 season vintage crop.

Under the acreage-poundage program, USDA is required to announce the national marketing quota for Flue-cured tobacco by December 1, 1979. The 1979 quota was 1,095 million pounds, or about the same as prospective use. Supplies equal about 2.8 years use compared with the desired supply of 2.4 years, according to the legislative formula. The effective quota for 1980 will increase from the basic quota because below-quota marketings exceeded over-quota marketings in 1979.

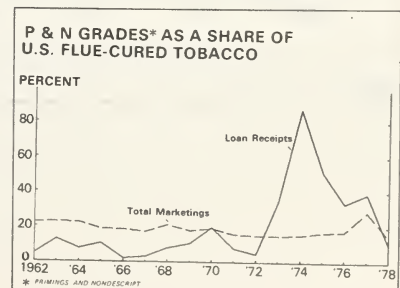
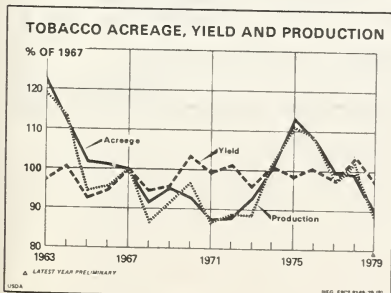
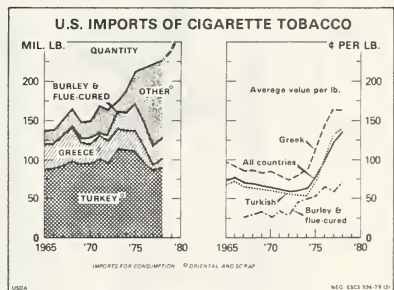
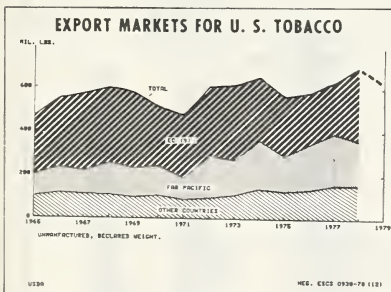
The 1979-80 supply of burley tobacco is 3 percent below last season. Carryover on October 1 was unchanged. This year's crop is down one-sixth. Acreage is down 5 percent and yields are down 11 percent.

Burley disappearance was maintained in 1978-79 when exports and domestic use stabilized. Burley benefited from increased use in both domestic and foreign cigarette blends. Carryover stocks next October 1 likely will decline.

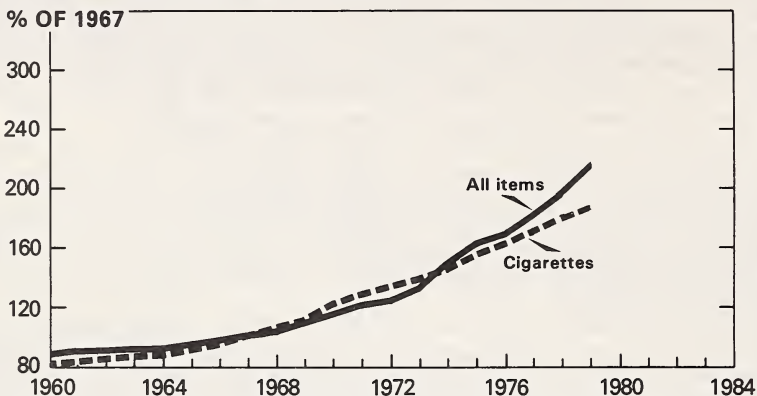
Burley poundage legislation requires that the national quota not be less than 95 percent of estimated disappearance for that year. With disappearance around 615 million pounds for the past 3 years, USDA could keep the 1980 burley marketing quota near this season's 614 million pounds. A planned reduction in supplies would require a quota reduction. The 1980 farm quota will be increased by the production shortfall from this year's quota.

For both Flue-cured and burley, USDA must proclaim quotas for the 1980-82 crops and hold producer referendums to decide whether producers desire quotas for their next three crops.

Supplies of southern Maryland and Fire-cured tobacco are smaller than last season. For dark air-cured and cigar kinds, supplies are larger this season.



CONSUMER PRICE INDEX AND CONSUMER PRICES

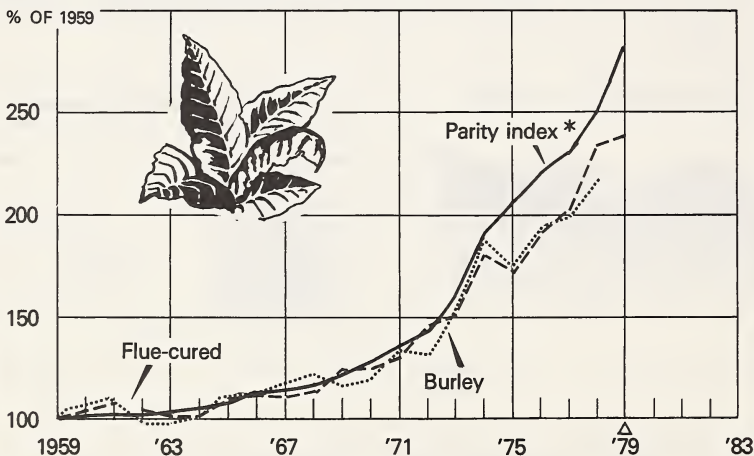


BLS DATA. BEGINNING 1978 FOR ALL URBAN CONSUMERS. CIGARETTES, FILTER TIP, KING SIZE FOR 1960-77.

USDA

NEG. ESCS 7145-79 (9)

TOBACCO PRICES AND PARITY INDEX

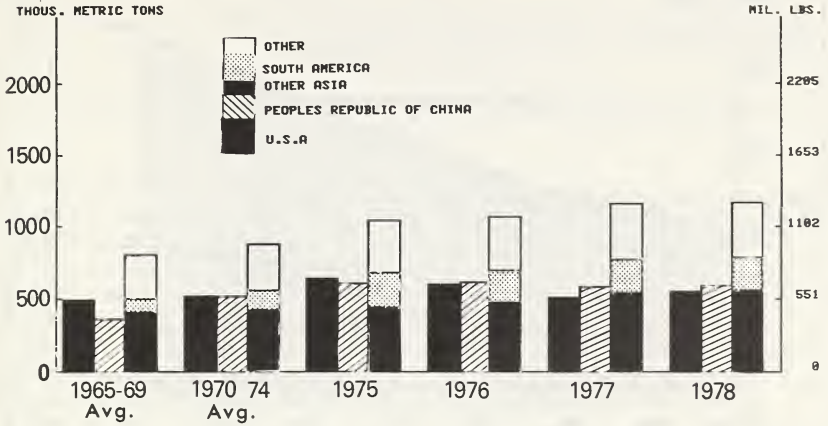


* PRICES PAID FOR ALL ITEMS INCLUDING INTEREST, TAXES, AND WAGE RATES. Δ SEPTEMBER 1 INDICATION.

USDA

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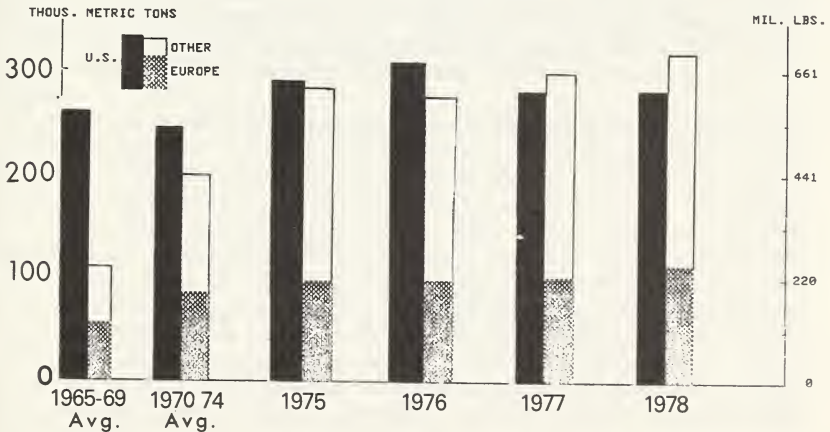
FLUE-CURED TOBACCO: ESTIMATED WORLD PRODUCTION



USDA

NEG. ESCS 2359-79 (2)

BURLEY TOBACCO: ESTIMATED WORLD PRODUCTION

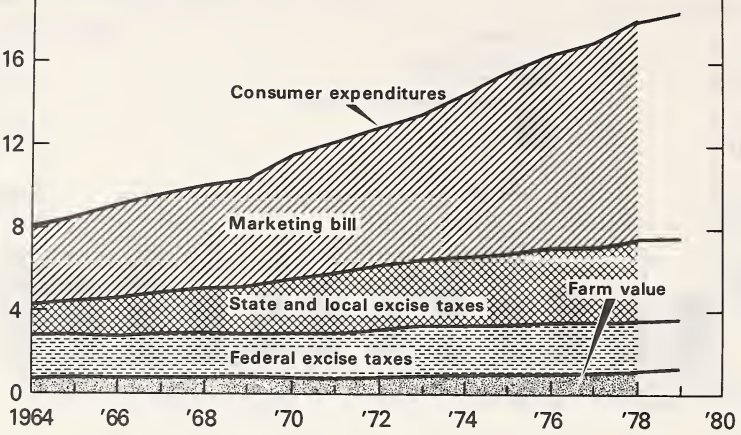


USDA

NEG. ESCS 2402-78 (12)

TOBACCO MARKETING BILL

BIL. DOL.



LATEST YEAR PRELIMINARY.

THE FLUE-CURED TOBACCO INDUSTRY—WHERE ARE WE HEADED?

(By R. W. Tuggle, vice president, Universal Leaf Tobacco Co., Inc.)

The 1979 Flue-cured crop is now sold, and this seems to be a good time to take another look at our leaf tobacco industry in an attempt to see where we are and where we are headed. I have listened to the Jeremiahs cite are the problems and predict the demise of the leaf tobacco industry now since the Great Depression; but, in all honesty, I must confess that never before have the problems appeared so numerous, so serious, so varied, or so resistant to solutions. I shall limit my remarks and data to Flue-cured tobacco for simplicity and brevity and also because the problems are most evident in this growth.

Let us look at some recent trends. In the period 1960-1964, world production of Flue-cured tobacco was about $3\frac{1}{3}$ billion pounds with U.S. production at $1\frac{1}{3}$ billion pounds or 41 percent (exhibits A and A-1). In 1979, world production has risen to about 5 billion pounds and U.S. production is down to just under 1 billion pounds or 21 percent of the total. Had we maintained our share of world production, we would be raising 2 billion pounds and each grower's quota would be nearly twice as large as it now is. Think how many problems that would solve. Since the period 1972-1976, world production has risen nearly 9 percent; except for Japan's decline of about 3 million pounds, the United States is the only country of consequence that is down, with a 15-percent decline (exhibit B). Brazil, for instance, is up over 75 percent.

Production in the 1975 crop reached 1,415 million pounds, admittedly an overproduction; the 1979 crop will be near 1 billion pounds or down from the 1975 figure by over 400 million pounds. The effective quota in 1979 is 1,070 million, down 500 million pounds from the 1975 figure of 1,572 million pounds (exhibit C). This means that the farmers' poundage quota is now on average only two-thirds as much as it was.

The above data should compel everyone interested in the industry to give serious thought as to what all this is telling us. We should never forget the importance to the Southeastern United States of tobacco as a cash crop and the cash flow it creates. In 1977 the farm value per acre of tobacco averaged \$2,376 per acre compared to the following crops: Soybeans \$162; corn \$183; cotton \$303; peanuts \$509; tree nuts \$900 (exhibit D).

The above calls for a closer look at the more specific problems we face. In the problem solving process, I find certain procedural steps must be taken. One must identify and define the problem, then determine the cause of the problem, and finally seek a way to remove, modify, or correct the cause; otherwise, we tend to treat symptoms rather than the disease.

The concerns we all share can be grouped under five headings: Pool inventory; loss of U.S. share of world exports; decline in domestic use of U.S. Flue-cured tobacco; increase in imports of foreign Flue-cured; and leasing.

Stabilization Inventory.—It is not possible to discuss our industry without discussing the price loan support program. I know of no serious, responsible person who advocates a choice between the present tobacco program and no program at all. The program has served the entire industry well for decades; however, we certainly should be able to look at certain provisions of the program and seek modification of such provisions if improvements can be realized. This has been done many times in the past. The pool problem is simply that there is a large volume of overvalued tobacco in the pool inventory; for example, there are nearly 200 million pounds of down-stalk tobaccos that are costed and are priced above the world market. There is nothing wrong with these tobaccos as to quality, and they are certainly salable at competitive prices. However, the support price on these tobaccos was above the world market price. To comply with the mandatory price support level, it has been necessary to support some qualities or stalk positions at a level at which they were not price-quality competitive in the marketplace. The stabilization pool should serve to stabilize; that is, not as a buyer of qualities that are supported above the normal market level and therefore continue to be unsalable, but rather as a reservoir in which certain kinds of qualities of tobaccos can be placed when supply is abnormally large or demand abnormally weak. The pool serves the entire industry well in this respect, and I think it is generally agreed that the pool should contain several hundred million pounds of balanced inventory to assure a continuing supply in times of shortages. Without the pool inventory, we could not have begun to fill our foreign customers' needs in the 1977 crop year.

Exports.—Our exports have remained about level in absolute exported pounds over the last 20 years. In the period 1960–64, we exported 397 million pounds out of a world total of 772 million pounds or 52 percent. In 1978 we exported 455 million pounds—a record or near record—out of a world total of 1,300 million pounds, or 35 percent—a decrease of 17 percent in our share (exhibit E). If we had maintained our share, we would now be exporting 52 percent of 1,300 million or 675 million pounds—which is some 200 million pounds more than we are exporting. We supplied the United Kingdom with 50 percent of all imports of tobacco in 1968 and only 17 percent in 1977 (exhibit F). These data should compel us to look at our prices as compared to competing growths (exhibit I). In looking at U.S. export prices, we need to remember that the major portion of our exports is made up of higher priced qualities.

Domestic Usage.—Domestic usage of U.S. Flue-cured has fallen from 703 million pounds in 1973 to 575 million in 1978 (exhibit G). This is a decrease in domestic usage of over 125 million pounds from 1973 to 1978. In the period 1960 through 1964, U.S. Flue-cured comprised 54.9 percent of the leaf used in U.S. cigarettes and imported tobaccos 10.2 percent (exhibit H). In 1978, the U.S. Flue-cured had fallen to 42.5 percent and imported leaf had risen to 21.9 percent. The imported percentage figures include Oriental as well as Flue-cured and burley.

Imports.—Imports of Flue-cured tobacco have certainly risen in the 1970's. It is difficult to get a precise figure because the "scrap" category includes Oriental scrap as well as Flue-cured and burley. In 1960-64 domestic usage of unstemmed processing weight was 1,200 million pounds and remained the same in 1978. However, imported tobacco weight used increased from 123 million pounds to 265 million pounds (exhibit J). No one questions the fact that imports of Flue-cured cigarette tobaccos have increased materially. There should be no false hope that efforts to change the tariff classification and duty rate on Flue-cured scrap will stop these imports. This tobacco can be imported in the unstemmed form at an effective duty rate comparable to the present "scrap" duty. In addition, trade is a two-way street and restrictions on imports could result in retaliation by others and harm our exports. Since our exports far exceed our imports, the United States would only stand to lose in restricting trade.

Leasing.—Of the total effective quota in 1978, the percent of quota leased out reached 36.9 percent for all Flue-cured and about 60 percent for the Georgia/Florida belt (exhibit K). The producer knows the leasing problem better than anyone else in the industry. Reports of prices on leased pounds range up to 60 cents or 65 cents per pound for some counties in Georgia. The Department of Agriculture estimates cost of production using bulk curing barns at 79.1 cents per pound for 1979 not including cost of land, cost of leasing, or cost of management (exhibit L), and the support price for the 1979 crop is \$129.30 per hundredweight. This places support at about 50 cents per pound above estimated production cost. The basic quota has been cut 15 percent, 12 percent, and 2 percent since 1975, and the effective quota is 32 percent less than it was. The economic laws of supply and demand have pushed the price of leasing to the present levels; with the margin in the area of 50 cents or 60 cents per pound and a diminishing supply and increasing demand for quota, this was inevitable. If one assumes an average of 40 cents per pound on 40 percent of the crop, this averages 16 cents per pound for the entire Flue-cured crop. There is no competing foreign growth producer who has to carry this burden in his costs.

Everyone in the industry supports the tobacco price support program; it has worked to the advantage of the entire industry for decades. However, if it needs updating or if it has flaws or imperfections that are substantial, then corrections should be made to improve the program as has been done many times in the past when needed. The program should protect the producer against severe price declines, ensure an adequate supply of tobacco at a price-quality level that is competitive in world trade, and should stabilize the supply. Our present program is today meeting only the first of these criteria successfully. The program now is typified by rising prices and diminishing production. It seems our goal should be expanding production through increased sales to domestic and foreign manufacturers. Substantial increased sales would solve or certainly mitigate all the problems discussed.

The U.S. Flue-cured tobacco producer has assets or advantages unmatched in the world—the support of the USDA; the land grant colleges; county agents; extension services; ideal land and weather for production of his crop; political and economic stability unmatched which guarantees continuity of supply; and, last, the most competent, knowledgeable, productive farmer in the world who can produce

tobacco with inherent good quality, taste, and aroma found nowhere else. Given the chance, he can compete with any producer in the world.

With all these things in our favor, certainly answers to our problems can be found among the leadership of the farm organizations, the economic expertise in our agricultural schools, and our State and Federal Departments of Agriculture. I think we all recognize the fact that there are certain risks in any attempt to make statutory changes in our tobacco program. Perhaps we should be careful that such concerns or fears don't blind us to the economic and political dangers that might result from ignoring these problems and doing nothing.

EXHIBIT A

UNITED STATES AND WORLD PRODUCTION OF FLUE-CURED TOBACCO, 1955-78

[Amounts in million pounds (farm-sales weight)]

Period	Flue-cured		
	United States	World total	United States as percent of total
Average:			
1955-59	1,208	2,914	41
1960-64	1,335	3,305	41
1966	1,108	3,531	31
1967	1,263	3,859	33
1968	982	3,649	27
1969	1,053	3,823	28
1970	1,193	3,937	30
1971	1,078	3,918	28
1972	1,012	4,076	25
1973	1,157	4,404	27
1974	1,241	4,788	26
1975	1,415	5,100	28
1976	1,316	5,021	26
1977	1,130	4,977	23
1978 ¹	1,230	5,121	24

¹ Subject to revision.

Source: ESCS and FAS, USDA.

EXHIBIT A-1

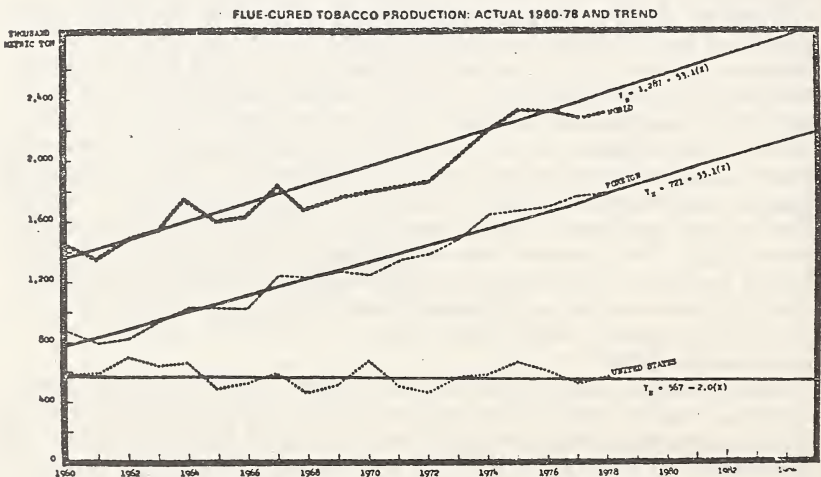


EXHIBIT B

FLUE-CURED TOBACCO: WORLD PRODUCTION IN SELECTED COUNTRIES, ACTUAL 1972-76, 1977, AND 1978, WITH ESTIMATES FOR 1979 ¹

[In thousand metric tons]

Country	1972-76	1977	1978 ²	1979 ³	Percent change, 1972-76 to 1979
China, Mainland	582	585	590	595	+2.2
United States	557	512	588	473	-15.1
Brazil	117	165	179	205	+75.2
India	123	95	134	135	+9.8
Canada	99	104	113	114	+11.6
Korea, Republic of	76	92	92	96	+25.8
Japan	91	102	100	88	-3.8
Rhodesia	78	80	77	87	+11.7
Thailand	28	48	46	48	+16.9
Other	362	460	439	456	+26.0
Total	2,113	2,238	2,328	2,297	+8.7

¹ Production on farm-sales-weight basis, which is about 10 percent above dry weight normally reported in trade statistics.

² Preliminary.

³ Estimated.

Source: USDA, FAS commodity programs.

EXHIBIT C

TABLE 9.—FLUE-CURED AND BURLEY TOBACCO: MARKETING QUOTA AND MARKETINGS, 1970-79

[In million pounds; Flue-cured, types 11-14]

Year	Quota		Marketings				Net carryover ²
	Basic	Effective	Actual	Over-quota	Under-quota	Effective under-quota ¹	
1970	1,071.5	1,190.8	1,178.2	65.1	71.2	63.4	-1.7
1971	1,071.6	1,069.9	1,076.3	60.4	49.9	45.8	-14.5
1972	1,071.2	1,056.7	1,022.1	41.2	72.9	68.1	26.8
1973	1,178.7	1,205.6	1,159.0	54.8	100.5	95.3	40.5
1974	1,296.6	1,337.1	1,245.3	50.0	138.9	132.4	82.5
1975	1,491.4	1,572.3	1,414.6	50.9	203.2	192.3	141.0
1976	1,268.1	1,409.1	1,316.0	49.4	139.9	130.2	80.8
1977	1,116.5	1,197.3	1,124.2	42.6	115.2	106.9	64.3
1978	1,117.2	1,181.5	³ 1,204.6	65.6	43.9	41.8	³ -23.8
1979 ³	1,094.0	1,070.2					

¹ Under quota marketing less ineligible carryover.

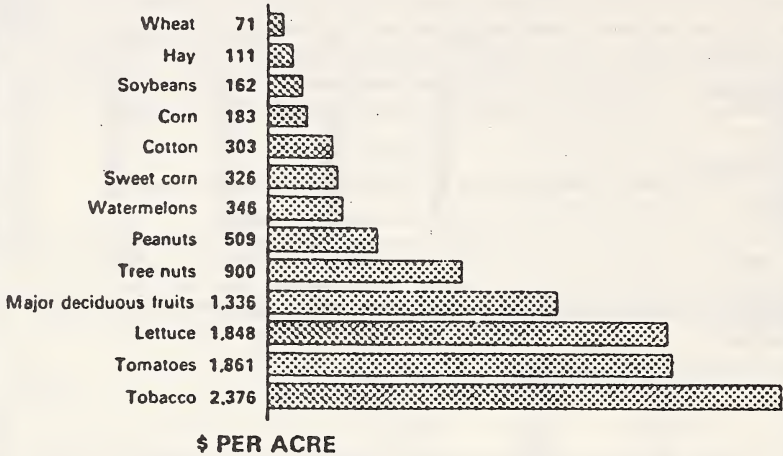
² Effective under quota marketings less over quota marketings.

³ Subject to revision.

Source: Compiled from records and reports of Price Support and Loan Division, ASCS.

EXHIBIT D

FARM VALUE PER ACRE FOR SELECTED CROPS, 1977



USDA

NEG. ESCS 2205-78 (9)

EXHIBIT E

UNITED STATES AND WORLD EXPORTS OF UNMANUFACTURED FLUE-CURED TOBACCO, 1955-79

[In million pounds; export weight ¹]

Period	Flue-cured		United States as percent of total
	United States	World total	
Average:			
1955-59	413	683	60
1960-64	397	772	52
1966	423	710	60
1967	427	750	57
1968	444	800	56
1969	430	845	51
1970	368	810	45
1971	342	893	38
1972	425	1,047	41
1973	418	1,049	40
1974	441	1,152	38
1975	391	1,010	39
1976	379	1,198	32
1977	412	1,226	33
1978	455	1,296	35
1979 ²	416	1,300	32

¹ Total excludes Sino-Soviet countries for 1955-73 period.² Subject to revision.

Source: ESCS and FAS, USDA.

EXHIBIT F

UNITED KINGDOM, TOBACCO: IMPORTS, BY MAJOR SUPPLIERS, 1968-78

[In million pounds]

Year	United States	India	Canada	South Korea	Brazil	Other	Total	United States as a percentage of—	
								Total	North American imports ¹
1968.....	165	52	44	1	0	66	328	50	76
1969.....	135	43	56	6	0	60	305	44	71
1970.....	117	41	47	13	1	61	280	42	71
1971.....	98	38	52	8	6	67	269	36	65
1972.....	120	37	59	19	8	65	298	40	67
1973.....	127	54	42	11	14	80	328	39	75
1974.....	104	65	65	22	16	90	362	29	62
1975.....	88	54	44	21	18	89	314	28	67
1976.....	78	55	35	26	32	93	319	25	69
1977.....	52	62	35	34	38	93	314	17	60
1978 ²	50	21	36	22	26	31	186	27	58

¹ United States and Canada.² January to June.

Source: Compiled from reports of commodity programs, Foreign Agricultural Service, USDA.

EXHIBIT G

PRODUCTION AND DISAPPEARANCE OF FLUE-CURED TOBACCO, 1973-79

[In million pounds; farm-sales weight]

Marketing year	Production ¹	Disappearance		
		Total	Domestic	Exports
1973.....	1,159	1,301	703	598
1974.....	1,245	1,200	652	548
1975.....	1,415	1,193	671	522
1976.....	1,316	1,148	634	514
1977.....	1,124	1,147	608	539
1978.....	1,204	1,185	575	610
1979 ²	1,040	1,085	515	570

¹ For the years 1973-78 the data represents sales.² Subject to revision.

Source: ESCS and FAS, USDA.

EXHIBIT H

ESTIMATED LEAF USED FOR CIGARETTES BY KINDS OF TOBACCO, 1950-78

[Percentage distribution]

Year	Flue-cured (percent)	Burley	Maryland	Imported	Total
Average:					
1950-54.....	58.2	33.3	2.0	6.5	100
1955-59.....	56.3	33.6	1.7	8.3	100
1960-64.....	54.9	33.6	1.3	10.2	100
1965.....	52.5	35.3	1.4	10.8	100
1966.....	51.0	36.2	1.6	11.2	100
1967.....	49.3	36.0	1.6	12.9	100
1968.....	48.5	35.8	1.5	14.2	100
1969.....	48.2	35.2	2.7	13.9	100
1970.....	48.2	35.0	2.4	14.3	100
1971.....	48.1	34.8	2.2	14.9	100
1972.....	47.2	35.0	1.4	16.4	100
1973.....	47.8	35.2	1.1	15.9	100
1974.....	46.7	34.9	1.0	17.4	100
1975.....	44.9	34.1	2.0	18.9	100
1976.....	45.6	33.6	1.8	19.0	100
1977.....	44.1	34.2	1.3	20.4	100
1978 ¹	42.5	34.0	1.6	21.9	100

¹ Subject to revision.

EXHIBIT I

FLUE-CURED TOBACCO: AVERAGE ESTIMATED EXPORT
 U.S.¢ per lb. PRICES, BY MAJOR PRODUCERS

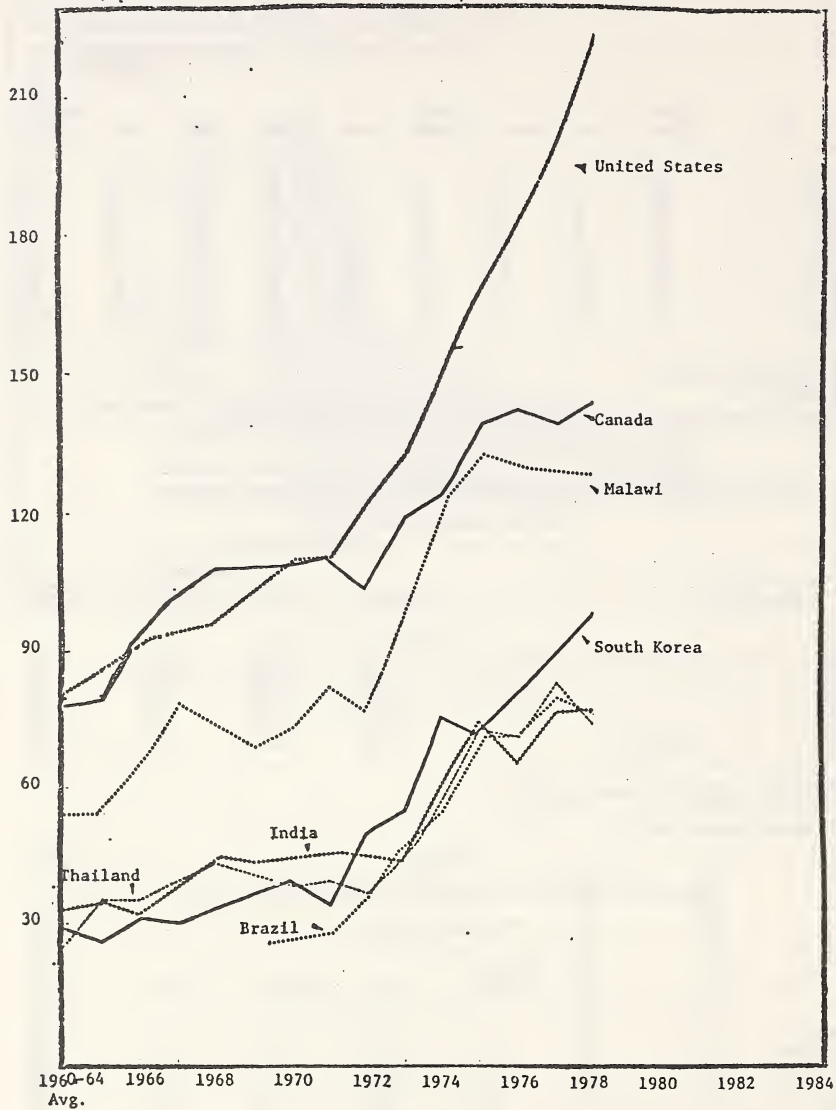


EXHIBIT J

ESTIMATED LEAF USED FOR CIGARETTES BY KINDS OF TOBACCO, 1950-78

[In million pounds]

Year	Unstemmed processing weight				Total
	Flue-cured	Burley	Maryland	Imported	
Average:					
1950-54.....	651	373	22	73	1,119
1955-59.....	622	371	19	92	1,104
1960-64.....	661	404	16	123	1,204
1965.....	643	433	17	132	1,225
1966.....	613	435	19	135	1,202
1967.....	587	432	19	154	1,192
1968.....	582	430	18	171	1,201
1969.....	546	399	31	157	1,133
1970.....	548	400	27	163	1,138
1971.....	532	386	24	165	1,107
1972.....	555	411	16	193	1,175
1973.....	588	433	14	196	1,231
1974.....	565	422	13	211	1,211
1975.....	548	416	25	231	1,220
1976.....	568	420	22	237	1,245
1977.....	522	406	16	242	1,186
1978 ¹	513	411	19	265	1,208

¹ Subject to revision.

EXHIBIT K

FLUE-CURED TOBACCO LEASE AND TRANSFER BY STATE, 1978 PRELIMINARY

State	Number farms	Effective quota (million pounds)	Number farms leased		Pounds leased (millions)		Percent leased
			In	Out	In	Out	
Alabama.....	273	0.9	45	200	0.5	0.5	57.6
Florida.....	7,163	24.0	876	5,756	16.5	16.5	68.9
Georgia.....	25,154	117.8	4,319	18,762	70.5	70.5	59.8
North Carolina.....	115,735	795.2	26,508	62,021	257.4	257.4	32.4
South Carolina.....	23,862	140.5	4,973	14,288	54.4	54.4	38.7
Virginia.....	20,907	103.0	4,031	10,739	36.0	36.0	34.9
Total.....	195,094	1,181.4	40,752	111,766	435.3	435.3	36.9

EXHIBIT L

TABLE 2.—ESTIMATED HARVEST AND TOTAL COSTS PER ACRE FOR FLUE-CURED TOBACCO, CONVENTIONAL BARN AND BULK BARN HARVEST SYSTEMS, 1978 AND 1979

Item	Unit	Quantity	1978 ¹		1979 ²	
			Price per unit	Value	Price per unit	Value
CONVENTIONAL BARN ³						
Preharvest costs				\$587.87		\$630.63
Harvest costs:						
Fuel	Gallon	408.0	\$0.47	191.76	\$0.47	191.76
Electricity	Kilowatt-hours	63.0	.052	3.28	.056	3.53
Twine	Pound	5.0	3.16	15.80	3.29	16.45
Sticks				7.38		7.38
Sheets				3.06		3.30
Tying machine ⁴	Hour	6.0	7.35	44.10	7.86	47.16
Tractor and equipment: ⁵						
Fuel	Gallon	47.2	.52	24.54	.67	31.62
Other				104.15		114.57
Barn ⁶	Acre	1.0	112.13	112.13	122.22	122.22
Marketing	Pound	2,100.0	(7)	76.23	(8)	81.27
Labor	Hour	175.0	92.53	442.75	92.75	481.25
Total harvest expenses ¹⁰				1,025.18		1,100.51
Total expenses ¹⁰				1,613.05		1,731.14
Cost per pound ¹⁰				.768		.824

TABLE 2.—ESTIMATED HARVEST AND TOTAL COSTS PER ACRE FOR FLUE-CURED TOBACCO, CONVENTIONAL BARN AND BULK BARN HARVEST SYSTEMS, 1978 AND 1979—Continued

Item	Unit	Quantity	1978 ¹		1979 ²	
			Price per unit	Value	Price per unit	Value
BULK BARN ¹¹						
Preharvest costs				\$587.87		\$630.63
Harvest costs:						
Fuel	Gallon	362.0	\$0.47	170.14	\$0.47	170.14
Electricity	Kilowatt-hour	840.0	.052	43.68	.056	47.04
Sheets				3.06		3.30
Riding primer ¹²	Hour	5.0	15.01	75.05	16.21	81.05
Tractor and equipment: ⁵						
Fuel	Gallon	36.4	.52	18.93	.67	24.39
Other				80.37		88.41
Barn	Acre	1.0	225.44	225.44	245.73	245.73
Marketing	Pound	2,100.0	(?)	76.23	(⁸)	81.27
Labor	Hour	105.0		265.65	⁹ 2.75	288.75
Total harvest expenses ¹⁰				958.55		1,030.08
Total expenses ¹⁰				1,546.42		1,660.71
Costs per pound ¹⁰				.736		.791

¹ Costs for 1978 taken from "Flue-cured Tobacco Production Costs—A Preview of 1978," Verner N. Grise, Tobacco Situation, TS-164, June 1978, pp. 29-32. A yield of 2,100 lb is assumed.

² Estimated costs of inputs primarily based on April and May 1979 input costs.

³ Costs are calculated for tobacco primed by walking primers, with the leaf put on sticks by tying machine and cured in conventional barn.

⁴ Fixed costs based on 72 hr annual use.

⁵ Tractor and equipment costs include a small and a large tractor. Mixed costs of machinery based on 500 hr annual use of small tractor and 750 hr annual use of large tractor. Fuel and other costs for hauling are included in equipment estimates.

⁶ Fixed costs based on curing 12 acres of tobacco annually.

⁷ 3 percent at \$1.21.

⁸ 3 percent at \$1.29.

⁹ Labor cost estimates based on wage rate increases for hired field workers from Apr. 9-15, 1978, to Apr. 8-14, 1979.

¹⁰ Excluding cost for land, management, and tobacco allotment.

¹¹ Costs are calculated for tobacco primed by tractor drawn priming aid and cured in bulk barn.

¹² Fixed costs based on 60 hr annual use.

TOBACCO OUTLOOK: TRENDS IN PRODUCTION COST AND QUOTA RENT

(By Max I. Loyd, Department of Agricultural Economics and Rural Sociology, Clemson University, S.C.)

The purpose of this discussion is to project tobacco production costs and rental rates for 1980, with some implications for rental rates in subsequent years. This would appear to be a formidable task for an outlook assignment. To begin with, we don't have accurate production cost (or rent) data on an annual basis. To further complicate the problem, production costs vary widely due to different sizes and types of operation, yields, management and other variables.

However, cost projections are essential in making production decisions. We can provide useful information in this area if we recognize our limitations. This analysis overcomes some of the limitations by using USDA and land grant university budget data as a base; then making projections by using the general trend in input prices. Individual growers can use this information by applying projected changes in input prices to their own operation.

Tobacco production costs are at record levels in terms of current dollars. Furthermore, prices for some inputs are increasing at unprecedented rates. The index of prices paid by farmers is expected to increase by about 14 percent in 1979. Tobacco production costs are not directly correlated with the index of prices paid. This is because some of the items in this index are not involved in tobacco production and

TABLE 1.—FLUE-CURED TOBACCO PRODUCTION COSTS PER ACRE, 1979 AND PROJECTED 1980¹

[2,100 lb yield per acre]

Cost item ²	1979 USDA costs	1980 as percent of 1979 ²	1980 projected costs	1980 Clemson budget cost ³
Labor.....	\$495.96	\$109.5	\$543.08	\$524.87
Equipment ⁴	488.36	111.0	542.08	460.24
Fertilizer.....	106.42	107.2	114.08	88.63
Chemicals.....	119.25	103.4	123.30	148.77
Fuel and electricity.....	257.65	144.2	371.53	337.00
Storage and marketing ⁵	81.27	⁵ 109.0	88.58	152.25
Crop insurance ⁵	62.50	⁵ 109.0	68.12	65.00
Interest on operating capital ⁶	32.22	⁶ 130.4	42.03	19.72
Other.....	17.08	115.0	19.64	5.76
Total, excluding land, management, general over- head quota.....	1,660.71	115.2	1,912.44	1,802.24

¹ Based on article by: Grise, Verner N., Flue-Cured Production Costs, TS 168, ESCS-USDA, June 1979.

² Cost classification and percent changes are based on index of prices paid by farmers; agricultural prices, ESCS-USDA, September 1979. Prices are projected through March 1980 using the annual rate of increase for September 1978-September 1979.

³ Based on South Carolina survey data.

⁴ Includes bulk barns.

⁵ Based on 1980 support price. Clemson cost includes storage and hauling.

⁶ Based on current interest rate and projected capital requirements.

the items included are weighted according to overall use rather than to specific enterprises. In 1978 and 1979 the index of prices paid increased more rapidly than tobacco production costs. Coincidentally however, it appears that the increase in tobacco production costs in 1980 will be about the same as the 1979 annual increase in the index.

PROJECTED 1980 PRODUCTION COSTS

Flue-cured production costs for 1979 and projected costs for 1980 are shown in table 1. The 1980 cost figures were computed by adjusting the figures from Grise's 1979 USDA Flue-cured cost estimate by projected price increases in cost items through March 1980. It was assumed that the price increases for the various categories of inputs for the next two quarters would be at the same rate as the previous four quarters. Clemson University budget figures are shown for comparison. The Clemson budget figures are based on an actual survey of farm supply and equipment dealers to determine projected 1980 input costs.

The hand-harvest/bulk-curing system was used in this analysis. This is one of the most common systems in use. (A 1979 South Carolina survey showed that 63 percent of the State's crop was harvested by hand and 80 percent was cured in bulk barns.)

A similar analysis for burley is shown in table 2. In this analysis cost figures from Grise's 1976 USDA burley cost study were adjusted using projected March 1980 input prices. Cost figures from the 1979 and 1980 Kentucky budgets are shown in table 3 for comparison.

This analysis indicates that 1980 production costs for burley will be about 13 percent above 1979 costs. The 1980 increase in Flue-cured production costs is estimated at about 15 percent. The greater increase for Flue-cured is primarily because fuel accounts for a larger share of cost while labor accounts for a larger share of cost for burley.

QUOTA RENTAL RATES

The projected increases in production costs gives us some indication of what might happen to quota rent in 1980. In general, rent is determined by the difference between production costs and expected gross returns. With a projected 9 percent increase in support prices, burley and Flue-cured prices are not likely to increase as much as production costs in 1980. This would indicate (but not ensure) a reduction in quota rent.

The *economic* rent per pound of tobacco quota is the gross return per pound less production costs. The *long run* equilibrium rental rate is the return above *variable and fixed costs*. Fixed costs include a normal profit (return to risk) and returns to management. In the short-run, rental rates may differ from the longrun equilibrium rate. For example, during 1973-75, with increasing quotas, rental rates were somewhat below the longrun equilibrium rate. Quotas have been decreasing since 1975, and some growers with excess production capacity have found it necessary to bid rental rates above the longrun equilibrium rate (that is, production decisions in this case are based on minimizing losses from fixed assets). Table 4 gives an analysis of breakeven rental rates based on 1980 conditions. The breakeven *short-run* rate is the expected return above variable costs, management and

risk. However, growers who are not able to cover fixed costs will be forced out of production in the longrun.

TABLE 2.—BURLEY PRODUCTION COSTS PER ACRE, 1976 AND PROJECTED 1980¹

Cost item ²	1976 USDA costs	1980 as percent of 1976 ²	1980 projected costs
Labor.....	\$840.86	131.8	\$1,108.25
Fertilizer and lime.....	139.59	103.6	144.62
Chemicals.....	17.67	87.9	15.53
Fuel and lubricants.....	43.04	195.6	84.19
Crop insurance ⁴	28.90	⁴ 140.0	40.46
Marketing fees ⁴	118.54	⁴ 140.0	166.00
Miscellaneous variable costs ⁵	135.82	141.5	192.18
Machinery ownership costs.....	229.08	140.3	321.40
Barn ownership costs.....	268.58	132.6	356.14
General farm insurance.....	27.49	141.5	38.90
Irrigation costs.....	10.28	141.5	14.54
Total, excluding land, management, general overhead and quota...	1,859.85	133.5	2,482.21

¹ Based on article by Grise, Verner N., Costs of Producing Burley Tobacco—1976, Tobacco Situation TS 163, ESCS, March 1978.

² Same as Flue-cured.

³ Based on estimated 1980 prices.

⁴ Projected at some percentage of gross as 1976.

TABLE 3.—BURLEY PRODUCTION COSTS PER ACRE, 1979 AND 1980, UNIVERSITY OF KENTUCKY BUDGETS¹

Cost item	1979	1980
Fertilizer and lime.....	\$100.50	\$100.50
Plants.....	50.00	60.00
Chemicals.....	70.00	80.50
Crop insurance.....	65.00	65.00
Insurance and repairs on buildings and equipment.....	150.00	171.00
Machinery operation.....	160.00	180.00
Marketing and hauling.....	195.00	260.00
Other.....	29.50	35.50
Total cash costs.....	820.00	952.50
Machinery depreciation and interest.....	87.00	116.00
Building depreciation and interest.....	418.00	541.50
Total overhead (or fixed).....	96.00	112.00
Costs.....	601.00	769.50
Labor.....	900.00	900.00
Total costs, less land and quota.....	2,321.00	2,622.00

¹ Cost figures from budgets prepared by Stephen Q. Allen, Department of Agriculture, Econ., University of Kentucky.

TABLE 4.—BREAKEVEN QUOTA RENTAL RATES, PER POUND¹

[In cents per pound]

Item	Flue-cured	Burley
Price.....	145	145
Variable costs ²	77	71
Difference.....	68	74
Return to management and risk.....	16	16
Short-run breakeven rate.....	52	58
Fixed costs, including land.....	17	32
Long-run breakdown rate.....	35	26

¹ Cost data from Clemson University and University of Kentucky budgets. Burley price projection is by author (Kentucky budget uses 135 cents per pound).

² Includes labor. Also includes general farm overhead for Flue-cured.

In 1979, both burley and Flue-cured rental rates were in the 40-50 cents per pound range in many areas. Numerous cases of 55-60 cent Flue-cured rates were reported. Flue-cured growers paying these higher rates most likely failed to cover total costs. The same situation will hold for burley if market prices are comparable to Flue-cured.

Rental rates are likely to be somewhat lower in 1980. After the disappointing 1979 prices (at least for Flue-cured) growers are likely to be more pessimistic about 1980 prices. Also, undermarketings in 1979 will lead to higher effective quotas in 1980 for both burley and Flue-cured, even if basic quotas are reduced moderately. However, some lessees are again likely to face local rental rates that will not allow them to cover fixed costs and provide a satisfactory return to management.

Looking further into the future, rental rates could be expected to fluctuate around the longrun break-even level. This does not mean that the longrun break-even level is fixed. The theoretical break-even level can increase or decrease from year to year. Generally under the current tobacco program, rent will tend to increase with future improvements in production technology, since the support price formula is based on the index of prices paid rather than actual production costs.

Quota rental rates will continue to be an economic issue. Tobacco price or income support is not economically or politically feasible without production controls. Production rights under any such program will have value and will command rent. Any future price support/production control program will have to deal with this reality.

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WORLD OUTLOOK FOR SUGAR AND TROPICAL
PRODUCTS []

(By Robert M. McConnell, Foreign Agricultural Service, U.S. Department of
Agriculture)

INTRODUCTION

This presentation covers the world situation and outlook for a number of commodities—sugar, coffee, cocoa, and tea. Only one of these, sugar, has a direct link to the U.S. agricultural sector, but each of the commodities has an impact on the American consumer. For sugar, domestic producer and retail prices move in relation to world prices, which can be influenced by such divergent occurrences as the price of gold in Zurich or low producer prices for cane in India. As for coffee and cocoa, when was the last time you had a 5-cent cup of coffee or candy bar? Coffee is the leading agricultural import item, by value, with annual entries now totaling approximately \$4 billion. Cocoa bean and product imports are now valued at over \$1 billion annually. In a search for some relief from the relatively high coffee prices, U.S. consumers have turned to tea. Changes in the supply picture of these latter commodities, over which the U.S. consumer generally has no control, can profoundly impact on individual household expenditures and the overall U.S. balances of trade and payments.

SUGAR

World sugar production in 1979–80 may be off 4 percent from the previous year, while consumption is expected to rise 2 percent (chart 1). The forecasted 3.3 million metric ton deficit will result in the first drawdown in world sugar stocks since 1971–72. World prices for sugar during 1980 are expected to remain strong and will average well above those in the first half of 1979 and the previous 3 years.

Production

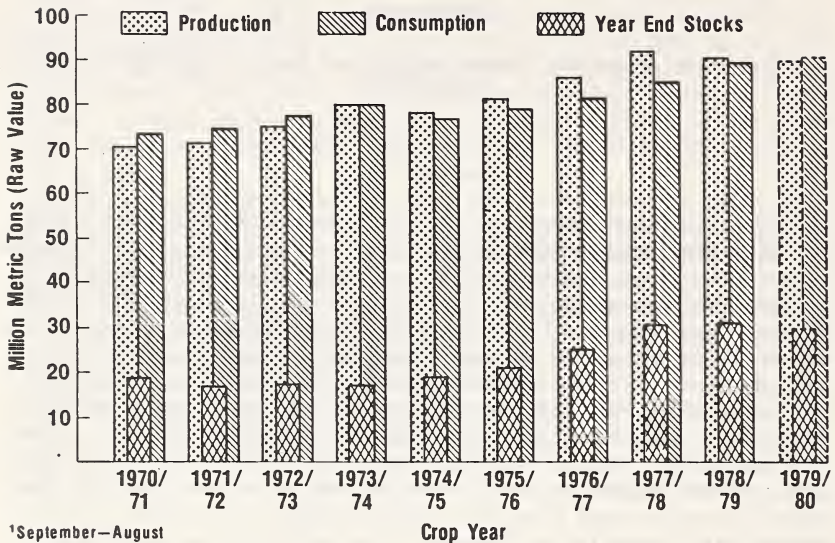
After reaching a record level of 92.6 million metric tons in 1977–78, sugar production declined to 90.9 million tons in 1978–79. For 1979–80, it is forecast by the Foreign Agricultural Service (FAS) that output will drop 4 percent and total only 87.7 million tons (see app. table 1). The expected decline in production is the result of both decisions on the part of some countries to cut back output for various reasons, and unfavorable weather conditions in other countries.

(331)

CHART 1

Sugar - World Production, Consumption and Year End Stocks

Crop Years¹ 1970/71 - 1979/80



It should be noted that while there is agreement among most analysts that the 1979–80 crop will be below the previous year's level, there is a difference between the FAS/USDA forecast of the 1979–80 crop and those of various other analysts. This can be seen in the following comparison:

Entity	Forecast of 1979/80 crop (million metric tons, R.V.)
FAS/USDA	87.7
C. Czarnikow	¹ "Higher than Licht"
F. O. Licht	88.0
E. D. and F. Man	89.3
Woodhouse, Drake and Carey	89.3
World Sugar Journal	88.7

¹ Review No. 1461, dated Oct. 11, 1979.

Production in North America, including the Caribbean, will be down 4 percent in 1979–80. While output will be off significantly in the United States and Cuba, some gains will be registered in Mexico, Guatemala, and Honduras.

U.S. sugar production is forecasted to drop and total only slightly in excess of 5 million tons in the upcoming year. Much of this decline can be attributed to a reduction in sugar beet area as the result of factory closings.

It now appears that production in Cuba during 1979–80 will be only 6.5 million tons. A number of reasons have been given for this drop, although unfavorable weather conditions and the extended 1978–79 harvest season may be the most significant. Mexico expects to produce

a record 3.1-million tons, up slightly from the previous high recorded last season. Sugarcane was carried over from the 1978-79 season and this, plus good weather will account for the greater output. After a relatively poor year in 1978-79, Guatemala's sugar industry is expected to produce 425 thousand tons of sugar. The drop in last year's crop was due mainly to financial troubles which forced several mills to remain closed during the season. It now appears that hurricane damage to the crop in the Dominican Republic was minimal.

For South America production will be down about 700,000 tons (5 percent) as higher output in several producers will be offset by lower output in Brazil. Brazil's production for 1979-80 has been placed at just under 7 million tons, 10 percent below the nearly 7.8 million tons produced in 1978-79. This production drop is not related to Brazil's gasohol program, which draws its raw material from molasses or cane grown specifically for the program. A return of more favorable weather conditions should help production in Peru to recover somewhat. The situation is the same in Argentina, while 1979-80 production in Columbia may be little changed from 1978-79.

A slight production change—1979-80 compared to 1978-79—will be experienced in Europe, both Western and Eastern, where output this year will be about 1 percent below last year's level. This will be despite very large declines in Spain (26 percent), the Netherlands (16 percent), and Poland (9 percent). Only Yugoslavia is expected to register a sizable production gain.

For the European Community as a whole, sugar production in 1979-80 is forecast to be 12.3 million tons, almost unchanged from the 1978-79 figure. Markedly lower crops in the Netherlands and West Germany offset gains in France and the United Kingdom.

The greatest production decline for all of Europe will be experienced in Spain, where output is forecast to drop nearly 300,000 tons. The production curtailment has come about mainly through a reduction in planted area, as farmers—faced with high production costs, especially labor—chose to produce crops other than sugar beets.

For Eastern Europe production in 1979-80 is expected to be slightly higher than in 1978-79. A significantly larger output in Yugoslavia—based on both an increase in area harvested and better yields—and moderately better crops in several other countries in the area are expected to offset a 150,000-ton drop in Poland's sugar outturn. This decline was due in part to unfavorable spring weather which reduced planted area.

For the U.S.S.R. it is forecast that sugar production (from domestically produced beets) will be only 8.5 million tons in 1979-80. This would be well below any target set by the Government (the 1979 target was 9.7 million tons) and is below the amount produced in 1978-79. This year's sugar beet crop (the basis for the 1979-80 sugar output) experienced considerable weather-related problems. The late, wet spring was followed by about 2 months of drought conditions in most of the major beet-producing areas of the country. This indicated in mid-July that production would fall short of the previous year's level. However, rains in July and August followed by above normal temperatures in much of September in the Ukraine and some other impor-

tant beet areas raised prospects for the crop considerably. The pace of this year's harvest was generally ahead of last year, but the usual problem of forcing the harvest thereby leaving thousands of tons of beets stacked in fields, was evident. Below freezing temperatures in many areas at the end of September may have had an effect on these beets.

Production in Africa may be up 4 percent, as many nations on that continent continue to move toward self-sufficiency. This is true in Egypt, where a larger harvested area and higher cane output will lead to a 2-percent increase in sugar production in 1979-80. The sugarcane crop, and therefore sugar production, is expected to recover somewhat in Mauritius. Output in South Africa, the continent's leading sugar producer, may be up less than 1 percent.

The greatest production change—in this case decline—is forecast to occur in Asia, where the 1979-80 output will be 1.2 million tons (6 percent) below the previous year's level. Output in a number of major producers in the area will be down.

The 1979-80 sugar outturn in mainland China will be off an estimated 5 percent.² It is believed that most of this was the result of unfavorable weather conditions. In India, the world's leading producer of sugarcane, output of centrifugal sugar (including khandsari) may total only 6.5 million tons, 11 percent below the 1978-79 total. The prolonged dry spell in the principal cane growing states has adversely affected cane crop prospects. Additionally, low cane prices in recent years have caused some farmers to shift to other crops, while greater quantities of cane are expected to be diverted to the production of gur, the price of which is not controlled. The outlook for sugar production in Thailand is far from optimistic. It is forecast that cane production in 1979-80 will be only 15 million tons, 30 percent below last year's level due to lack of moisture during the planting and early growth period, as well as some reduction in cane area. With less cane produced and the likelihood of a lower sucrose content, the 1979-80 sugar production of about 1.3 million tons will be considerably below the output of last year and the lowest since 1974-75. Moderate production gains are expected for the Philippines and Taiwan, but in neither case will the 1979-80 output approach past high points. However, sugar output in Indonesia may reach a record high.

Production in Australia will be up only slightly, as output continues to be controlled so as to match marketing opportunities. For Fiji the 1979-80 output may be 15 percent greater than the previous year's output, and set a new high for the industry.

Trade

For the 1978-79 crop year total world sugar imports were about 24.7 million tons. Of this quantity approximately 75 percent was obtained on the "free market," while the remainder was under special arrangements.

It is forecast that total sugar imports may be up 1 to 2 million tons in 1979-80. Much of this gain is expected to take place in the Soviet Union and mainland China, as imported sugar substitutes for lower domestically produced supplies. For the United States, the

² Although revised earlier this year, the production series for mainland China is again being reviewed in light of new data relative to output in the past several years.

world's leading "free market" importer, a reduction in stocks during 1979-80 may offset the expected lower production, thereby holding down the need for greater imports.

Consumption

World sugar consumption advanced at an average rate of 3 percent per year during the past decade, with a decrease occurring in only 1 year—1974-75. The average annual absolute gain was slightly in excess of 2 million tons during the period.

Much of the growth in sugar consumption in recent years has taken place in developing countries and in the centrally planned economies. On the other hand, sugar usage in most industrialized countries has either stagnated or actually declined in the past 10 years.

For 1979-80 it is forecast that sugar consumption throughout the world will approximate 91 million tons. This projected level is 1.6 million tons above the estimated figure for 1978-79. It is believed that the current and foreseen relatively high prices for sugar will exert a downward pressure on demand and thereby slow the rate of growth in consumption.

Stocks

After rising steadily for 7 crop years, world sugar stocks will decline in 1979-80. From a level of 32.5 million tons at the start of this crop year, it is forecast that stocks will drop to 30.2 million tons at the close of the year. This 3.3 million ton decline will be the sharpest annual cutback since the early 1960's. Despite this very sizable reduction, world sugar stocks would still represent about one-third of world sugar needs during 1979-80.

Prices

In view of recent developments in world sugar prices, forecasting this element of next year's sugar picture is, to put it mildly, difficult. However, there are some basic factors which allow for reasonable assumptions regarding prices during the upcoming months.

There is no doubt that the recent runup in world sugar prices—from a spot quotation³ of 8.69 cents per pound on August 20 prices rose rather steadily to reach 12.89 cents on October 26—was influenced significantly by the rise in precious metal prices, and the general atmosphere which prevailed in commodity markets during the period.

However, this price rise also came at a time when many market analysts were becoming more acutely aware of the probable turnaround in sugar's supply/distribution picture in 1979-80. During the past month or so, the prospects for the European beet harvest became clearer. Likewise, the size of the beet crop in the U.S.S.R. was a little more definite. The outlook in such major cane-producing countries as India, Brazil, and Australia also became clearer.

This combination of a general rise in commodity prices and the clearer indication of a tighter supply picture in 1979-80 lead traders to bid up the price of sugar. While the former factor may have abated, the expected production deficit in 1979-80 should maintain sugar prices at relatively high levels during the upcoming months. On the other hand, the substantial quantity of sugar stocks forecasted to be

³ New York Coffee and Sugar Exchange.

COFFEE

For the 1979-80 crop year (October-September) the production of coffee throughout the world will be up 4 percent from the previous year (chart 3). However, forecasted yearend stocks in producing countries will be off 3 percent, as the demand for coffee is expected to be up somewhat from the 1978-79 level. In view of this situation, it is expected that coffee prices (both green and roasted) will remain at relatively high levels through 1980.

Production

It is currently estimated by FAS that world coffee production in 1979-80 (October-September) will be 80.2 million bags (60 kilograms each). A country-by-country breakdown of production can be found in appendix table 2.

Coffee - World Production, Consumption and Year End Stocks

Crop Years¹ 1970/71 - 1979/80

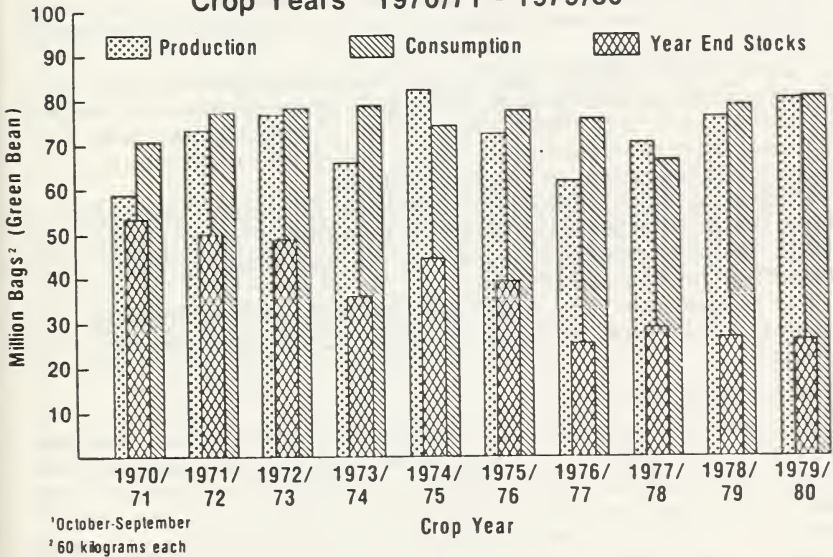


CHART 3

At the estimated level of production, the crop would be the largest since the record 82.5 million bag output in 1974-75, and would be 3.3 million bags greater than the outturn in 1978-79. The 1979-80 crop continues the pattern of successively higher annual production which has occurred since the low crop of 1976-77, following the disastrous 1975 frost in Brazil.

Much of growth in production since 1976-77 can be accounted for by the rebound in coffee output in Brazil. For the current crop year it is estimated that production in that country will be 22.5 million bags, compared to 20 million bags in 1978-79 and only 9.3 million bags in 1976-77.

The frost of May 30–June 1—the earliest recorded freeze in some of the coffee production zones—came at a time when the current year's crop had not been fully harvested. However, most of the then unharvested cherries had reached full development. Therefore, while the frost may have had an adverse affect on the quality of Brazil's 1979–80 crop, it had little impact on the volume.

The cold wave did, however, change the 1980 crop outlook. Currently, it is forecast that next year's coffee output in Brazil will be 20 to 22 million bags, about 23 percent below the prefreeze potential of 26.2 to 28.5 million bags. The frost did considerable damage to coffee trees, especially in the state of Minas Gerais—an area previously considered frost free.

Colombia, the world's second largest coffee producer, is expected to harvest a record 11.5 million bags of coffee in 1979–80. After rising rapidly in the mid-1970's, annual output has grown only moderately in the past several years. There have been some concerns voiced recently that the intensive cultivation of coffee has contributed to severe soil damage in certain areas of the country. At the same time, a new coffee variety—*Variedad Colombia*—has been developed. It has a high resistance to certain rust strains and will be available for plantings in 1980.

Output during 1978–80 by the three leading Central American producers—Mexico, El Salvador, and Guatemala—is expected to total 9.5 million tons, only slightly higher than during the past year. Further near-term production gains in the region may depend as much on political considerations as weather conditions.

Production in the Ivory Coast will be 4.8 million bags, slightly above the 1978–79 level, but below the quantities produced in the mid-1970's. Weather conditions have been the key factor influencing the production level in recent years.

The 1979–80 crop in Indonesia is now placed at 4.2 million bags. This revised output level is based on higher than previously estimated exports.

Trade/consumption

A precise estimate of world coffee consumption is not available. However, a reasonable facsimile may be devised from combining consumption in and exports by coffee-producing nations; both of these factors have been compiled by the Foreign Agricultural Service. Although there may be some periodic exceptions, over the long term stock levels in importing nations are relatively steady. Therefore, exports to—and in turn, imports by—the nonproducing nations may be equated to consumption in those nations.

Based on supply and distribution data contained in FAS coffee circular, FCOF 4-79 (August), it is forecast that 1979–80 world coffee (beans, roasted, and soluble) exports will be 59.8 million bags (green bean equivalent—g.b.e.). This would be about the same as in 1978–79, but 24 percent above the level in 1977–78, when the volume of coffee moving in world trade was held down by high prices. Subsequent, unpublished estimates of world trade tend to modify these data somewhat, but the basic S. & D. situation remains largely unchanged.

Brazil is expected to continue its role as the world's leading coffee exporter in 1979–80, shipping 13.5 million bags (g.b.e.). This is about

the same amount as exported in the previous year. Other major shippers in 1979-80 are: Columbia (9.6 million bags), Ivory Coast (4.4 million bags), Indonesia (3.2 million bags), El Salvador (3 million bags), and Guatemala, Mexico, and Uganda (each with 2.4 million bags). Forecasted 1979-80 exports will be at or better than the 1978-79 levels in all countries mentioned except Indonesia (down 14 percent) and Columbia (down 1 percent).

Domestic consumption in the producing countries is forecast to reach 20.6 million bags in 1979-80. This level is 5 percent greater than the figure for the previous year. Five countries (Brazil, Columbia, Ethiopia, Mexico, and Indonesia) will account for 72 percent of total consumption in producing countries, with Brazil by far the leader.

When the 1979-80 coffee exports and producer country consumption are combined, the resulting figure—derived from world coffee consumption—is 80.3 million bags. This surpasses the 1978-79 figure by 1 percent, and is a record level.

Stocks

Carryover stocks at the end of the 1979-80 coffee year are expected to dip to 26.2 million bags. This will be 3 percent below the figure at the end of the 1978-79 year, and the second lowest level in recent years. At the projected level, yearend stocks would represent only 33 percent of derived world consumption. This is quite a different situation from 1974-75—just 5 years ago—when yearend stocks constituted 60 percent of consumption.

Prices

From a 1979 low point of \$1.26 per pound in mid-February, world prices for green coffee climbed almost steadily to about \$1.50 by the end of May.⁴ Following news of this year's frost in Brazil, prices climbed to \$2.13 per pound by the end of June; they have remained around \$2 for much of the subsequent time.

Further threat of frost in Brazil ended with the onset of spring in September, and therefore, a major portion of the 1979-80 world coffee crop is fixed. However, several factors would appear to moderate any downward pressure in prices. The general supply/demand picture for the year indicates that stocks at the close of 1979-80 will be quite low. This, coupled with another frost-reduced crop in Brazil in 1980-81, points to a tight supply picture for possibly another several years.

In the shorter run, the arrival of cold weather in North America and Europe signals the beginning of the period of high coffee consumption. Thus roasters are more active in the market, as they seek to obtain supplies to cover consumer demands.

At the same time, a group of eight Latin American coffee organizations, commonly referred to as the Bogota group, have intervened in the world coffee market. Much, if not all, of the group's intervention has been in the trading of futures contracts in the New York and London coffee markets. While it is difficult to assess the group's actual impact, it is safe to say that it will take all steps necessary—utilizing a fund that now reportedly totals \$600 million—to stop any significant decline in market prices from today's levels.

⁴ International Coffee Organization composite prices for green coffee (basis 1976 ICA) are utilized in this discussion.

International coffee agreement

The International Coffee Council held its 33d session in London, September 24-28. From the beginning of the meetings, including those of the executive board held from September 17 to 21, the overriding issues were:

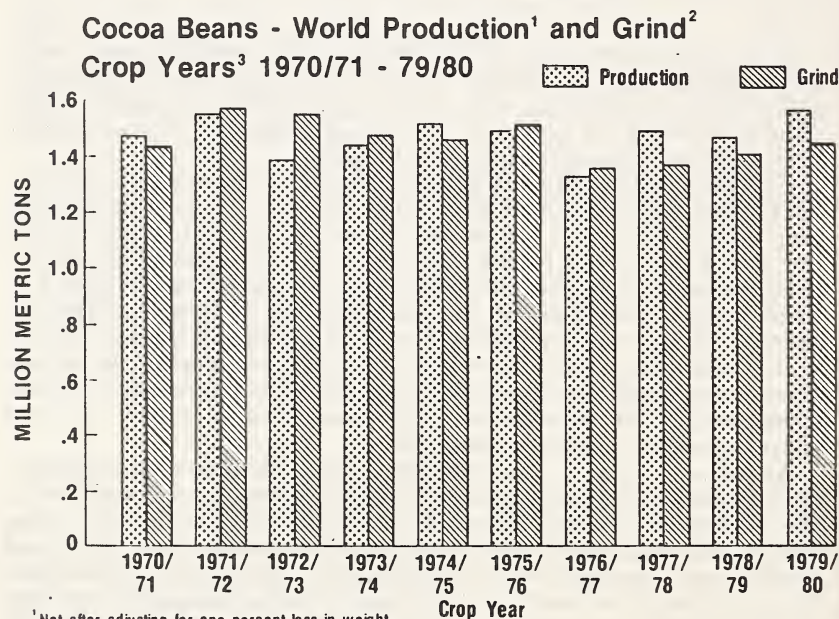
(1) Efforts by both consumers and producers to reach agreement on a revised export quota trigger price arrangement; and

(2) Activities of the Bogota group in the market.

Both areas were left unresolved. The Council failed to agree on a new trigger price, and producers flatly stated that the Bogota group would continue to operate in the market. Both sides were not all that unhappy with the "status quo." Producers are satisfied with current coffee prices, and believe prices are likely to remain relatively high for some time. On the other side, the coffee import trade greatly prefers an unfettered market. With the trigger price for quota remaining at 77 cents a pound, economic provisions of the 1976 coffee agreement will remain inoperative.

COCOA

A record cocoa crop is forecast for the 1979-80 season and it is likely that for the third successive year output will exceed usage (chart 4). This should exert some downward pressure on cocoa bean and semiprocessed product prices, but little change can be expected in retail prices of finished cocoa and chocolate products.



¹ Net after adjusting for one percent loss in weight

² Calendar year grind, refers to last year of crop year

³ October-September

Production

World cocoa bean production in 1979-80 (October-September) is forecast at 1,586,000 tons, more than 6 percent greater than the output in 1978-79. (See appendix table 3 for detailed statistics.) If the expected production is realized, the 1979-80 harvest would be the largest on record, exceeding the previous high point (the 1971-72 crop) by about 1 percent.

The 1978-79 crop in the Ivory Coast—the world's leading producer—approximated a record 320,000 tons, and early season prospects for the 1979-80 harvest indicate another bumper outturn. Although the 1979-80 crop will be somewhat later than usual, new plantings coming into bearing and young trees increasing in productivity will likely boost production to a record level this season. As a further incentive to increase production, the Government has raised producer prices for the 1979-80 crop by 20 percent to the equivalent of about 66.5 U.S. cents per pound.

Brazil's production for 1979-80 is forecast at a record 320,000 tons, up from the bumper 1978-79 harvest of 314,000 tons. Reportedly, Brazil has about 450 million cocoa trees planted, with about 300 million currently in production. Further production gains can be expected in the next several years as these young trees come into bearing; Brazil's plan is to produce 700,000 tons by 1993.

Output in Ghana, only a few years ago the world's leading producer, will rebound 11 percent in 1979-80 from the very low level last year, reflecting improved weather conditions. The decline in Ghana's production over the years has been attributed, in part, to low producer prices, which resulted in neglect of the farms and discouraged new plantings. Producer prices for the 1979-80 crop have been increased by 50 percent to the equivalent of approximately 66 U.S. cents per pound. However, subsidies on spraying machines and materials were removed.

Another major producer which has experienced setbacks in recent years is Nigeria. Rural-to-urban migration of farmers and workers, the Government's emphasis on an industrial-based economy, and poor weather have all contributed to the decline of Nigeria's cocoa industry in recent years. However, due to more favorable growing conditions, production in 1979-80 is forecast to reach 175,000 tons, 27 percent greater than the poor 1978-79 harvest, which was the lowest in over two decades. Producer prices for the 1979-80 season were increased by 16 percent and are equal to 87 U.S. cents per pound.

Given favorable growing conditions, another record harvest is forecast for Ecuador this season. The 1978-79 crop was placed at 83,000 tons, and production could reach 85,000 tons in 1979-80. High world prices and strong demand from the domestic processing industry have encouraged farmers to improve cultural practices and to harvest marginal producing areas.

Production in Malaysia during 1979-80 is forecast at a record 28,000 tons—22 percent greater than the previous year's crop—as new plantings come into bearing. The current area under cocoa is estimated at about 55,000 hectares, compared with 47,000 hectares in 1978 and only 7,400 hectares in 1970. New plantings continue, and officials predict that Malaysia will rank among the major cocoa producers of the world by the turn of the century.

Consumption

Despite inflation and the current global economic slowdown, world cocoa bean grindings in 1980 are forecast to show a modest increase over the 1979 level of 1.4 million tons, reflecting anticipated lower prices and more plentiful supplies (see appendix table 4). Cocoa consumption in recent years has been adversely affected by manufacturers using more extenders and substitutes, and by shifting to the production of more nonchocolate confectionery items in their product lines.

Cocoa bean grindings in the United States during the first 9 months of 1979 were 5 percent greater than during the corresponding period a year earlier. Thus, 1979 U.S. grind seems likely to top the depressed 1978 level and will probably show a modest increase in 1980, unless there is a sharp increase in imports of cocoa products.

West German grind for January–September 1979 totaled 102,748 tons, slightly below the 104,802 tons processed during the similar 1978 months. Netherlands grind for the 9 month 1979 period amounted to 94,365 tons, just above the 92,150 tons ground during the corresponding 1978 period. However, grind in the United Kingdom for the period fell 18 percent below the 9 month 1978 level to 45,700 tons. Total grinding in these three Western Europe countries during 1980 is expected to be up slightly from the 1979 level.

It is likely that the U.S.S.R. diverted a portion of the foreign exchange availabilities previously allocated for cocoa for needed grain imports this year. Thus, Soviet cocoa bean grindings and imports will likely remain at low levels in 1980. The U.S.S.R. ranks as the world's fourth largest cocoa consumer after the United States, West Germany, and the Netherlands.

Stocks

Although grindings are forecast to increase slightly, they are expected to remain well below anticipated production levels, thus indicating a buildup in world stocks for the third year in a row. World stocks were increased by an estimated 64,000 tons in 1979, following an increase of 116,000 tons a year earlier. For 1980 it is possible that stocks might grow by 120,000 tons—the gross increase in stocks over the 3-year period might approximate 300,000 tons.

Prices

Cocoa prices have been at record high levels for the past several years, but a large crop this season should ease the tight supply situation that has prevailed for some time. New York cocoa bean prices (the average of the nearest three active futures trading months) during January–September 1979 averaged \$3.25 per kilogram (\$1.47 per pound), down from the 1978 annual average of \$3.36 per kilogram (\$1.53 per pound) and \$3.79 per kilogram (\$1.72 per pound) in 1977. October 1979 prices averaged near \$2.97 per kilogram (\$1.35 per pound).

With the expected further build-up in stocks next year, prices at the wholesale level are likely to move downward. However, little change can be expected in the retail pricing of finished cocoa and chocolate products, as manufacturers continue to work off high priced inventories, as well as cover rising production costs.

International Cocoa Agreement

The International Cocoa Agreement (ICA) was scheduled to expire on September 30, 1979, but was extended for 6 months. A session to renegotiate the ICA is scheduled to begin November 19 in Geneva. Considerable differences remain between the positions of producers and consumers on such things as the price range and market mechanisms.

TEA

World tea production is expected to reach a record amount in 1980, as production in India recovers somewhat and output in most other major producers continue its general upward trend. Demand is expected to remain strong as tea is utilized as a substitute beverage for relatively high-priced coffee. It is likely, therefore, that world tea prices in 1980 will approximate the levels experienced in 1979.

*Production*⁵

After reaching a record 1,481,000 metric tons in 1978, world tea production will decline slightly in 1979. (See appendix table 5 for details.) Much of this decline is due to a drop in production in India, where a prolonged drought in the important northeastern producing region has reduced the harvest.⁶ Other major producers—Sri Lanka, Japan, the U.S.S.R., and Kenya—will all have larger crops in 1979 than in 1978.

For 1980 it is forecast that tea production throughout the world will be about 1.5 million tons. Much of this predicted gain over the 1979 figure is based on the assumption that more favorable weather conditions will prevail in India. This factor, coupled with India's long-term expansion in tea production, will result in a significant increase in that country's harvest next year. At the same time, sizable production gains are expected in Kenya and several other African nations. The level of output in Sri Lanka will depend mostly on weather conditions, but probably will not vary greatly from the estimated 200,000 tons produced in 1979.

Consumption

It is likely that tea consumption in 1980 will get a boost from the expected high prices for coffee. While a considerable portion of world tea consumption takes place in producing countries—India, with annual tea usage approaching 350,000 tons, is the world's leader—significant amounts are also utilized in the United Kingdom, other Western European countries, and the United States. Demand in these countries is expected to be strong in 1980, as consumers use tea as a partial substitute for coffee.

Prices

London auction tea prices reached a record monthly average of \$1.87 per pound in April 1977, and then declined. Most of the monthly averages during 1978 and thus far in 1979 have been in the 90 cents to \$1 per pound range. For 1980 it is likely that prices will average about \$1, as expected higher production will be matched by continued strong demand.

⁵ World tea production statistics in this discussion exclude data for mainland China.

⁶ Based on more up-to-date information than that contained in appendix table 5 it is likely that India's 1979 tea harvest will be approximately 540,000–550,000 tons.

APPENDIX TABLE 1.—CENTRIFUGAL SUGAR: PRODUCTION IN SPECIFIED COUNTRIES

[In 1,000 metric tons, raw value]

Continent and country	1977/78		1978/79		1979/80	
	Beet	Cane	Beet	Cane	Beet	Cane
North America:						
Barbados		104		117		115
Belize		93		114		100
Canada	147		125		114	
Costa Rica		191		195		203
Cuba		7,200		7,000		6,500
Dominican Republic		1,164		1,190		1,200
El Salvador		293		273		250
Guadeloupe		87		96		107
Guatemala		410		376		425
Haiti		52		65		70
Honduras		131		159		185
Jamaica		306		358		350
Martinique		13		21		16
Mexico		3,029		3,058		3,100
Nicaragua		214		212		214
Panama		175		225		220
St. Kitts		36		40		38
Trinidad and Tobago		148		144		163
United States:						
Continental (beet)	2,820		2,945		2,631	
Continental (cane)		1,497		1,441		1,387
Hawaii		934		1,002		962
Puerto Rico		185		174		164
Total, North America	2,967	16,262	3,070	16,260	2,745	15,769
Total beet and cane	19,229		19,330		18,514	
South America:						
Argentina		1,665		1,387		1,400
Bolivia		277		314		277
Brazil		8,863		7,758		6,950
Chile	121		95		73	
Colombia		915		1,052		1,052
Ecuador		295		353		393
Guyana		342		334		350
Paraguay		77		84		85
Peru		881		720		800
Surinam		10		11		12
Uruguay	55	58	47	46	45	35
Venezuela		325		325		375
Total, South America	176	13,708	142	12,384	118	11,729
Total, beet and cane	13,884		12,526		11,847	
Western Europe:						
European Community:						
Belgium and Luxembourg		798		888		875
Denmark		558		435		439
France		4,268		4,065		4,174
Germany, West		3,076		2,998		2,930
Ireland		179		201		180
Italy		1,389		1,616		1,623
Netherlands		890		1,019		856
United Kingdom		1,032		1,113		1,200
Total, European Community	12,190		12,335		12,277	
Austria		520		375		382
Finland		75		104		109
Greece		295		351		353
Portugal:						
Azores (beet)		9		8		9
Madeira (cane)		2		2		1
Spain		1,169		1,101		807
Sweden		326		322		321
Switzerland		84		105		110
Total, Western Europe	14,668	16	14,701	6	14,368	8
Total, beet and cane	14,684		14,707		14,376	

APPENDIX TABLE 1.—CENTRIFUGAL SUGAR: PRODUCTION IN SPECIFIED COUNTRIES—Continued

[In 1,000 metric tons, raw value]

Continent and country	1977/78		1978/79		1979/80	
	Beet	Cane	Beet	Cane	Beet	Cane
Eastern Europe:						
Albania.....	21	-----	21	-----	21	-----
Bulgaria.....	275	-----	275	-----	265	-----
Czechoslovakia.....	924	-----	970	-----	1,000	-----
German Democratic Republic.....	782	-----	700	-----	725	-----
Hungary.....	469	-----	530	-----	550	-----
Poland.....	1,819	-----	1,736	-----	1,587	-----
Romania.....	609	-----	650	-----	700	-----
Yugoslavia.....	738	-----	765	-----	840	-----
Total, Eastern Europe.....	5,637	-----	5,647	-----	5,688	-----
Total, beet and cane.....	5,637	-----	5,647	-----	5,688	-----
Total, Europe.....	20,305	16	20,348	6	20,056	8
Total, beet and cane.....	20,321	-----	20,354	-----	20,064	-----
U.S.S.R.:						
Europe and Asia.....	8,825	-----	9,000	-----	8,500	-----
Africa:						
Angola.....	-----	60	-----	65	-----	65
Egypt.....	-----	667	-----	657	-----	670
Ethiopia.....	-----	150	-----	165	-----	170
Kenya.....	-----	194	-----	259	-----	337
Madagascar.....	-----	110	-----	112	-----	115
Mauritius.....	-----	705	-----	705	-----	745
Morocco.....	245	26	325	50	325	50
Mozambique.....	-----	260	-----	250	-----	250
Reunion.....	-----	261	-----	286	-----	278
Rhodesia.....	-----	275	-----	275	-----	280
South Africa, Republic of.....	-----	2,211	-----	2,210	-----	2,228
Swaziland.....	-----	238	-----	257	-----	274
Tanzania.....	-----	101	-----	130	-----	162
Uganda.....	-----	15	-----	10	-----	12
Zaire.....	-----	58	-----	52	-----	57
Other Africa.....	29	567	35	574	39	614
Total, Africa.....	274	5,898	260	6,057	364	6,307
Total, beet and cane.....	6,172	-----	6,417	-----	6,671	-----
Asia:						
Burma.....	-----	130	-----	130	-----	135
China, Mainland.....	304	2,161	337	2,343	350	2,225
China, Taiwan.....	-----	768	-----	891	-----	890
India.....	-----	8,217	-----	7,343	-----	6,524
Indonesia.....	-----	1,125	-----	1,159	-----	1,325
Iran.....	580	106	533	150	490	150
Japan.....	360	270	401	292	407	290
Pakistan.....	32	890	33	620	37	712
Philippines.....	-----	2,397	-----	2,347	-----	2,383
Thailand.....	-----	1,584	-----	1,828	-----	1,260
Turkey (Europe/Asia).....	1,065	-----	1,079	-----	1,070	-----
Other Asia.....	115	361	118	331	125	343
Total, Asia.....	2,456	18,009	2,501	17,434	2,479	16,237
Total, beet and cane.....	20,465	-----	19,935	-----	18,716	-----
Oceania:						
Australia.....	-----	3,322	-----	2,965	-----	2,975
Fiji Islands.....	-----	361	-----	347	-----	400
Total, Oceania.....	-----	3,683	-----	3,312	-----	3,375
Total, beet and cane.....	3,683	-----	3,312	-----	3,375	-----
World total:						
Beet.....	35,003	-----	35,421	-----	34,262	-----
Cane.....	-----	57,576	-----	55,453	-----	53,425
Beet and cane.....	92,579	-----	90,874	-----	87,687	-----

APPENDIX TABLE 2.—COFFEE, GREEN: TOTAL PRODUCTION IN SPECIFIED COUNTRIES: AVERAGE 1970/71-1974/75
ANNUAL 1975/76-1979/80¹[In thousands of 60-kg bags]²

Region and country	Average, 1970/71- 1974/75	1975/76	1976/77	1977/78	1978/79	1979/80
North America:						
Costa Rica.....	1,416	1,276	1,331	1,490	1,764	1,600
Cuba.....	472	415	450	425	450	450
Dominican Republic.....	807	1,040	728	1,025	680	700
El Salvador.....	2,549	2,530	2,968	2,400	3,000	3,000
Guatemala.....	2,187	2,043	2,613	2,350	2,600	2,700
Haiti.....	575	565	520	545	440	660
Honduras.....	712	636	691	1,036	1,100	1,150
Jamaica.....	24	32	20	23	20	24
Mexico.....	3,629	3,856	3,650	3,600	3,800	3,800
Nicaragua.....	663	790	852	967	1,075	1,150
Panama.....	79	66	78	105	92	95
Trinidad-Tobago.....	51	42	60	44	60	50
United States, Hawaii.....	19	11	13	14	11	12
United States, Puerto Rico.....	208	191	145	197	200	175
Total, North America.....	13,390	13,492	14,118	14,221	15,292	15,566
South America:						
Bolivia.....	91	124	108	118	122	130
Brazil.....	20,380	23,000	9,300	17,500	20,000	22,500
Colombia.....	8,120	8,500	9,300	11,050	11,300	11,500
Ecuador ³	1,143	1,244	1,690	1,238	1,868	1,650
Guyana.....	12	15	17	17	17	18
Paraguay.....	76	139	41	71	143	120
Peru.....	1,035	881	947	1,050	1,080	1,100
Venezuela.....	978	923	656	1,061	958	1,000
Total, South America.....	31,835	34,826	22,059	32,105	35,488	38,018
Africa:						
Angola.....	3,528	1,180	1,112	1,121	900	1,000
Benin.....	29	19	17	3	15	15
Burundi.....	391	279	359	285	387	360
Cameroon.....	1,433	1,482	1,307	1,371	1,650	1,520
Central African empire.....	185	150	166	164	180	180
Congo, Brazzaville.....	13	28	33	46	40	40
Equatorial Guinea.....	113	90	90	80	90	100
Ethiopia.....	2,427	2,677	2,882	3,024	3,000	3,000
Gabon.....	10	1	7	3	6	8
Ghana.....	59	56	76	40	70	70
Guinea.....	79	23	39	25	40	30
Ivory Coast.....	4,280	5,266	4,867	3,320	4,667	4,835
Kenya.....	1,122	1,244	1,687	1,417	1,134	1,252
Liberia.....	79	88	156	137	133	142
Madagascar.....	1,139	1,065	1,048	1,273	893	1,300
Nigeria.....	54	67	53	46	45	45
Rwanda.....	324	434	531	362	311	380
Sierra Leone.....	131	64	168	77	217	146
Tanzania.....	874	959	805	835	834	900
Togo.....	172	151	177	82	150	120
Uganda.....	3,265	2,214	2,664	1,868	2,000	2,200
Zaire (Congo, K).....	1,385	1,072	1,437	1,279	1,300	1,300
Total, Africa.....	21,093	18,608	19,675	16,858	18,062	18,963
Asia:						
India.....	1,589	1,498	1,813	2,180	1,856	1,841
Indonesia.....	2,425	3,049	2,824	3,241	4,652	4,200
Malaysia.....	84	135	125	121	142	145
Philippines.....	493	483	550	575	600	660
Portuguese Timor.....	63	75	65	75	(⁴)	(⁴)
Vietnam.....	55	62	60	65	70	70
Yemen, Arab Republic.....	52	45	45	50	50	50
Total, Asia.....	4,761	5,345	5,482	6,307	7,370	6,946
Oceania:						
New Caledonia.....	27	25	25	25	25	25
Papua New Guinea.....	556	711	700	626	680	700
Total, Oceania.....	583	736	725	651	705	725
World total.....	71,663	73,008	62,059	70,142	76,917	80,238

¹ Coffee marketing year begins about July in some countries and in others about October.² 132.276 lb.³ As indicated in footnote 1, the coffee marketing year begins in some countries as early as July. Ecuador is one of these countries. Hence, the crop harvested principally during June to October 1978 in that country is shown as production for the 1978/79 marketing year. In Ecuador, however, this is referred to as the 1977/78 crop.⁴ Beginning 1978/79 included in Indonesia.

Note: Production estimates for some countries include cross-border movements. Also, due to rounding, country totals may not add to area and world totals.

Source: Prepared or estimated on the basis of official statistics of foreign governments, other foreign source materials, reports of U.S. agricultural attachés and Foreign Service officers, results of office research, and related information.

APPENDIX TABLE 3.—COCOA BEANS: PRODUCTION IN SPECIFIED COUNTRIES, 1974/75-1979/80¹

[In thousands of metric tons]

Region and country	1974/75	1975/76	1976/77	1977/78	1978/79	Forecast, 1979/80
North America:						
Costa Rica	8.0	7.2	9.4	9.0	9.0	9.0
Cuba	2.0	2.0	2.0	2.0	2.0	2.0
Dominican Republic	33.0	34.0	33.0	34.0	35.0	29.0
Granada	2.4	2.9	2.1	2.8	2.5	2.5
Guatemala	.8	.8	.8	.8	.8	.8
Haiti	3.0	3.0	3.0	3.0	3.0	2.8
Honduras	.3	.3	.3	.3	.3	.3
Jamaica	1.8	1.6	1.8	1.5	1.8	1.8
Mexico	32.2	33.1	24.2	34.7	36.0	37.0
Nicaragua	.6	.6	.5	.6	.3	.4
Panama	.7	.5	.5	.5	.5	.5
Trinidad and Tobago	5.1	2.4	4.0	3.6	3.5	4.0
Others ²	.4	.4	.4	.4	.4	.4
Total	90.3	88.8	82.0	93.2	95.1	90.5
South America:						
Bolivia	2.7	3.0	3.0	3.0	3.0	3.0
Brazil	266.6	257.4	234.0	283.0	314.0	320.0
Colombia	27.3	27.5	30.5	31.5	32.0	33.0
Ecuador	71.5	58.6	69.3	78.0	83.0	85.0
Peru	2.8	3.0	3.5	4.0	5.0	5.0
Surinam	.1	.1	.1	.1	.1	.1
Venezuela	19.0	16.0	16.6	16.7	17.0	17.0
Total	390.0	365.6	357.0	416.3	454.1	463.1
Africa:						
Angola	.4	.2	.2	.2	.2	.2
Cameroon	117.8	96.0	84.5	108.2	107.0	110.0
Comoro Islands	.1	.1	.1	.1	.1	.1
Congo	2.3	2.4	2.5	2.5	2.5	2.5
Equatorial Guinea	12.0	12.0	5.0	5.0	5.0	7.0
Gabon	4.2	3.7	3.5	3.2	3.5	3.5
Ghana	375.0	397.0	325.0	271.0	265.0	295.0
Ivory Coast ³	241.5	231.1	232.4	303.6	320.0	330.0
Liberia	2.8	2.8	3.0	3.1	3.0	3.0
Madagascar	1.4	1.6	1.8	1.9	1.8	1.8
Nigeria ⁴	214.0	217.0	166.0	204.0	138.0	175.0
Sao Tomé and Príncipe	8.0	6.0	4.7	7.0	7.0	7.0
Sierra Leone	4.7	6.1	6.3	6.7	7.0	7.0
Tanzania	.7	.8	.8	.8	.7	.7
Togo ³	14.5	17.8	15.5	16.0	14.0	15.0
Uganda	.1	.1	.1	.1	.1	.1
Zaire	6.0	5.0	5.0	4.5	4.0	4.0
Total	1,005.5	999.7	856.4	937.9	878.9	961.9
Asia and Oceania:						
Indonesia	4.0	3.7	4.6	4.0	4.5	5.0
Malaysia	12.2	15.4	17.3	21.0	23.4	28.0
New Hebrides	.6	.6	.8	1.0	.9	.9
Papua New Guinea	33.3	31.3	27.8	29.1	30.0	30.0
Philippines	3.3	3.2	2.9	3.2	3.5	3.5
Sri Lanka	1.5	1.0	1.5	1.5	1.5	1.5
Western Samoa	1.5	1.6	1.4	1.4	1.5	1.5
Total	56.4	56.8	56.3	61.2	65.3	70.4
Grand total	1,542.2	1,510.9	1,351.7	1,508.6	1,493.4	1,585.9

¹ Estimates refer to an October to September crop year.² Includes Dominica, St. Lucia, Guadeloupe, and Martinique.³ Includes some cocoa marketed from Ghana.⁴ Includes cocoa marketed through Benin.

Source: Foreign Agricultural Service. Prepared or estimated on the basis of official statistics of foreign governments, other foreign source material, reports of agricultural attachés and Foreign Service officers, results of office research and related information.

APPENDIX TABLE 4.—WORLD COCOA BEAN SUPPLY—DEMAND AND APPARENT STOCK CHANGE, 1949/50–1979/80

[In thousands of metric tons; prices in cents per pound]

October to September season	Production ¹		Grind ²	Apparent stock change	New York spot Accra cocoa bean prices ³
	Gross	Net			
1949/50.....	768	760	789	-29	29.0
1950/51.....	806	798	756	+42	36.7
1951/52.....	647	641	726	-85	35.2
1952/53.....	809	801	809	-8	34.2
1953/54.....	786	778	744	+34	56.5
1954/55.....	786	778	731	+47	41.4
1955/56.....	836	828	837	-9	28.8
1956/57.....	898	889	919	-30	27.2
1957/58.....	761	753	858	-105	43.5
1958/59.....	899	890	874	+16	38.0
1959/60.....	1,043	1,033	931	+102	29.9
1960/61.....	1,164	1,152	1,026	+126	23.5
1961/62.....	1,125	1,114	1,120	-6	21.9
1962/63.....	1,162	1,150	1,154	-4	23.9
1963/64.....	1,239	1,227	1,194	+33	24.1
1964/65.....	1,491	1,476	1,340	+136	18.4
1965/66.....	1,220	1,208	1,388	-180	23.1
1966/67.....	1,336	1,323	1,386	-63	27.5
1967/68.....	1,352	1,338	1,410	-72	30.9
1968/69.....	1,236	1,224	1,353	-129	45.1
1969/70.....	1,423	1,409	1,355	+54	37.3
1970/71.....	1,493	1,478	1,438	+40	29.2
1971/72.....	1,572	1,556	1,565	-9	29.0
1972/73.....	1,406	1,392	1,556	-164	55.5
1973/74.....	1,458	1,443	1,478	-35	91.2
1974/75.....	1,542	1,527	1,463	+64	82.7
1975/76.....	1,511	1,496	1,519	-23	92.0
1976/77.....	1,352	1,338	1,363	-25	189.8
1977/78.....	1,509	1,494	1,378	+116	147.7
1978/79.....	1,493	1,478	1,414	+64	154.3
1979/80 ⁵	1,586	1,570	1,450	+120	-----

¹ FAS data. An adjustment of 1 percent for less in weight is made to arrive at a net production figure.² Gill & Duffus data. Calendar year grind, refers to last year of crop year.³ Average for October to September year.⁴ Beginning October 1977, all price data refers to the average of the daily closing price of the nearest 3 active futures trading months on the New York Cocoa Exchange.⁵ Forecast, FAS data.

Source: Foreign Agricultural Service. Prepared or estimated on the basis of official statistics of foreign governments other foreign source material, reports of agricultural attaches and Foreign Service officers, results of office research and related information.

APPENDIX TABLE 5.—TEA: PRODUCTION IN SPECIFIED MAJOR PRODUCING COUNTRIES, AVERAGE, 1969–73, ANNUAL 1974 TO 1979

[In thousands of metric tons]

Continent and country	Average 1969–73	1974	1975	1976	1977	1978	1979 ¹
Asia and Oceania:							
Bangladesh.....	25.1	32.2	29.0	33.3	37.5	36.5	36.0
China, Taiwan.....	27.1	24.2	26.1	24.8	26.3	25.9	26.0
India.....	435.1	492.1	489.4	514.4	562.8	573.3	560.0
Indonesia.....	47.4	51.7	56.8	61.1	64.7	73.4	75.0
Iran.....	19.9	25.0	23.0	22.0	20.0	25.0	20.0
Japan.....	93.9	95.2	105.4	100.1	102.3	104.7	105.0
Malaysia.....	3.4	3.2	3.1	3.2	3.2	3.0	3.2
Papua New Guinea.....	2.1	4.5	5.0	6.0	6.5	6.7	7.0
Sri Lanka.....	214.9	204.0	213.7	196.6	208.6	199.0	200.0
Turkey.....	38.2	42.8	55.6	59.5	84.1	95.0	95.0
USSR.....	68.3	80.8	86.3	92.0	106.4	103.0	105.0
Vietnam ²	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Total.....	980.9	1,060.7	1,098.4	1,118.0	1,227.4	1,250.5	1,237.2

APPENDIX TABLE 5.—TEA: PRODUCTION IN SPECIFIED MAJOR PRODUCING COUNTRIES, AVERAGE, 1969-73, ANNUAL 1974 TO 1979—Continued

[In thousands of metric tons]

Continent and country	Average 1969-73	1974	1975	1976	1977	1978	1979 ¹
Africa:							
Burundi.....	0.3	0.9	0.9	1.2	1.5	1.5	1.6
Cameroon.....	1.3	1.6	1.8	2.0	1.0	1.9	2.0
Kenya.....	44.7	53.4	56.7	62.0	86.3	93.4	102.0
Malawi.....	19.7	23.3	26.2	28.3	31.7	31.7	30.0
Mauritius ³	3.9	4.0	3.1	4.3	4.7	4.7	4.7
Mozambique.....	17.4	17.6	13.1	13.8	14.0	18.0	16.0
Rhodesia.....	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Rwanda.....	1.8	3.4	4.0	4.9	5.4	6.0	6.5
Tanzania.....	10.6	13.0	13.7	14.1	16.7	17.3	17.5
Uganda.....	19.5	21.7	18.4	15.4	15.0	10.2	5.0
Zaire.....	8.2	6.5	5.5	5.0	4.5	4.5	4.5
Total.....	130.4	148.4	146.4	154.0	183.8	192.2	192.8
South America:							
Argentina.....	22.8	26.0	29.0	33.0	33.5	25.3	28.0
Brazil.....	6.0	6.5	6.5	7.0	7.0	9.0	9.0
Ecuador.....	.5	1.0	1.0	1.2	1.3	1.5	1.5
Peru.....	1.9	2.2	2.2	2.5	2.5	2.5	3.0
Total.....	31.2	35.7	38.7	43.7	44.3	38.3	41.5
Grand total.....	1,142.5	1,244.8	1,283.5	1,315.7	1,455.5	1,481.0	1,471.5

¹ Preliminary.² Production refers to south region only.³ Year ending June 30th.

Source: Foreign Agricultural Service. Prepared or estimated on the basis of official statistics of foreign governments, other foreign source material, reports of agricultural attachés and Foreign Service Officers, results of office research and related information.

U.S. OUTLOOK FOR SWEETENERS AND TROPICAL PRODUCTS

(By Owen K. Shugars, Fred Gray and Robert Barry, Agricultural Economists, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

INTRODUCTION

This discussion of the U.S. outlook for sweeteners and tropical products will include coffee, tea, and cocoa in addition to sweeteners. Since the United States is both producer and consumer of sweeteners, emphasis will be on sugar and corn sweeteners. We depend on foreign production of coffee, tea, and cocoa, but they are very important consumption items. For example, the value of U.S. coffee imports in 1978 was more than \$4 billion, making it in dollar terms our most important agricultural import. Cocoa, chocolate, and tea imports all together totaled around \$1.5 billion in 1978. We will have more to say about these tropical products but will turn first to sweeteners.

OVERVIEW OF SWEETENERS OUTLOOK

Last year, at this time, the sweeteners outlook was fraught with uncertainty. In reviewing last year's outlook talk, one is struck by the statement: "Until U.S. sugar policy is more clearly defined, congressional review of sugar policy and administrative support decisions authorized under existing law are expected to remain major factors affecting sugar prices and the sweetener situation and outlook."

In general this statement applies also to the 1980 outlook for sweeteners. But some important changes have occurred:

1. The sugar price support-loan program provided in the Food and Agricultural Act of 1977 expired with the 1978 crops of sugarbeets and sugarcane.

2. The Secretary of Agriculture instituted an interim price support-loan program for 1979-crop sugar under general authority provided in the Agricultural Act of 1949 as amended. This interim program was to provide minimum price support coverage for 1979-crop sugarbeets and sugarcane until new legislation was implemented or a subsequent program adopted.

3. In late August, September, and October, world raw sugar prices rose sharply to levels that triggered successive reductions in U.S. import fees until on October 24 the fee on raw sugar was zero.

4. On October 23, 1979 the U.S. House of Representatives voted against the International Sugar Stabilization Act of 1979 (H.R. 2172).

Whether this combination of events has added to or lessened uncertainty could be debated. However, the question of U.S. ratification of the International Sugar Agreement remains unresolved, clearly adding to uncertainty. These events do suggest that in 1980 the U.S. sweetener market will be much more directly influenced by the world sugar economy than it was for most of 1979. Let us look at the sweetener situation in a bit more detail for a perspective on the outlook.

THE SWEETENER SITUATION

Sugar

Raw sugar prices, by virtue of their recent behavior, deserve first attention. For the first 9 months of 1979, the derived U.S. raw sugar prices (landed New York, duty and fees paid) averaged 15.1 cents a pound, 10 percent above the same period last year and in line with the 15-cent domestic price objective.¹ Because of import fee adjustments the domestic raw price was relatively stable. Monthly average prices differed from the January–September average by no more than 0.82 cent a pound. In late August, however, daily prices pushed above 16 cents a pound and triggered a 1-cent intraquarter import fee reduction effective September 1, the first time a fee adjustment had been necessary within a calendar quarter.

Domestic prices continued strong into September, averaging 15.72 cents (New York spot No. 12 contract) for the month. The fourth quarter fee adjustment, reflecting prices during the 20-day base period in the third quarter, reduced the import fee for raw sugar down to 1.76 cents per pound effective October 1. Raw prices continued strong and resulted in another intraquarter fee reduction of 1 cent per pound, effective October 18, followed by a 0.76-cent reduction effective October 24. With the October 24 fee adjustment the U.S. import fee for raw sugar was zero. For refined sugar imports, the fee stood at 0.52 cent per pound. The New York raw sugar spot price (No. 12 contract), for the first 20 market days in October averaged 15.92 cents per pound, up from 15.72 cents in September. The world price (measured by the No. 11 contract), rose from the September average of 9.80 cents to 11.85 cents per pound for the first 20 market days in October. Thus, the import fee adjustments buffered the U.S. price from the substantial rises in world raw sugar prices, but now with the fee at zero the buffer against further world price increases is gone.

Domestic wholesale prices of refined sugar have strengthened this year. Because of discounting practices this is not evident from reported list prices. The reported Chicago-West list price for refined sugar in 100-pound bags or liquid has held at \$19.15 per hundred-weight since January 1979, but the actual price was reportedly discounted to as low as \$17.50 last summer in some instances. Bulk sales are now occurring at actual prices of \$17.75 and above, while bagged and liquid sugar have been selling at above \$18.40. As domestic raw

¹The price used is a "derived" New York spot price, calculated by converting the London spot for sugar to a Caribbean basis in U.S. dollars and adding freight, insurance and U.S. duties and fees. It is a rough measure of U.S. raw sugar price movements and is not necessarily equivalent to market prices transacted by buyers and sellers. On Aug. 20, 1979, the New York Coffee and Sugar Exchange resumed reporting spot market prices for raw sugar. The Exchange's spot price for the No. 11 contract is a measure of the world raw sugar price, f.o.b. Caribbean and its No. 12 contract price a measure of the U.S. raw sugar price (New York spot).

sugar prices have increased in recent months, discounts under list for wholesale refined sugar have probably become smaller. Actual wholesale price trends in other territories are generally similar to Chicago-West, though discounts under list prices are reported to be significantly less than in the Midwest. With the exception of the Northeast, list prices have remained mostly unchanged. List prices in the Northeast increased from \$22.27 per hundredweight in January 1979 to \$23.79 in August then declined slightly in September to \$23.46.

The U.S. average retail price for refined sugar was 23.8 cents per pound in December 1978. The average price for May 1979 rose to 24.9 cents and has since held near that level. Retail sugar prices during first 8 months of 1979 rose 2.3 percent, but sweetener-containing products at retail exhibited a 5.6 percent increase during the same period.²

U.S. production of cane and beet sugar in crop year 1979-80 is expected to be down nearly 6 percent from the 1978-79 outturn. Estimates are for little change in cane sugar but 11 percent less beet sugar than in 1978-79. At 5.7 million short tons (raw value), estimated total production is about 1.5 million tons less than the record in 1975-76. On a calendar year basis, 1979 production will be little changed from 1978. This is because weather problems caused processing of a relatively large quantity of 1978-79-crop sugar beets to be postponed until after January 1, 1979.

Sugar beet acreage for the 1979-80 crop was cut back 12 percent, dropping to around 1.12 million acres. The cutback reflects closings of six sugar beet plants and a planned reduction in beet acreage in the Red River Valley where back-to-back bumper crops the last 2 years strained processing capacity. Washington, formerly a major beet State, did not grow any beets this year because of the closing of its only two processing plants. Current prospects are for U.S. beet yields to average about 19.9 tons per acre, down about 2 percent from 1978-79. Yields in the Red River Valley, the largest producing area, may drop 2 tons per acre. This and the elimination of the high-yielding Washington acreage are the chief reasons for lower U.S. yields in 1979-80. Total beet sugar production from the 1979-80 crop is expected to be about 2.9 million tons, raw value, down sharply from 3.25 million tons in 1978-79.

Sugarcane acreage (including seed) for harvest will likely total around 731,000 acres in 1979-80, down 1 percent from the previous season. Acreage expanded slightly in Florida and Hawaii, declined only slightly in Texas but dropped significantly in Louisiana. Louisiana's 1979-80 area for harvest of 270,000 acres is down from 289,000 in 1978-79. This fall, 25 cane processing facilities were scheduled to operate in Louisiana compared with 28 last year. The projected U.S. average cane yield for the 1979-80 crop is 37.0 tons per acre, up 1.9 tons from last year. Total cane sugar production is expected to be about 2.6 million short tons (raw value).

Calendar 1979 sugar deliveries, based on the trend for the most recent 12 consecutive months, seem likely to total around 10.7 million short tons compared with 10.89 million tons in 1978. Through mid-

² Measured by the simple average of the BLS indexes for 16 sweetener-containing product categories.

September, deliveries were down around 2 percent from the same period last year. First quarter deliveries were up, but there were significant slippages from a year ago in the second and third quarters. Sugar deliveries are competing with sharply increased deliveries of high fructose corn sirup.

With the expected decline in sugar deliveries and a larger population, per capita consumption of refined sugar in calendar 1979 seems likely to total under 91 pounds, down about 2 pounds from last year's level. This compares with 90 pounds in 1975, a year when consumption was influenced by record high sugar prices.

Sugar imports this calendar year seem likely to total between 5 and 5.5 million short tons. For the first 8 months of 1979, imports were 3.24 million tons (raw value), up about 18 percent from the same period a year ago. Moreover, recent import fee reductions may stimulate imports in the remaining months of this quarter.

On August 1, domestic sugar stocks had been drawn down to 2.91 million short tons (raw value) from nearly 3.8 million tons on January 1. Total stocks were about 6 percent higher than in August, 1978, but refiner stocks were down nearly 25 percent. Refiner stocks are down below the level refiners have historically attempted to maintain to supply industrial users, wholesalers, and retailers. Imports of around 5 million tons in 1979 would give end-of-year total stocks of about the same level as beginning stocks. U.S. sugar exports, relative to total supply, are insignificant and may total near last year's 16,000 tons.

Corn sweeteners

Corn sweetener prices increased significantly in 1979. The September price of \$15.21 per hundredweight for 42-percent high fructose corn sirup (HFCS) (Decatur, Ill.) was up more than 50 percent from April. Glucose corn sirup prices increased nearly a fifth in New York, and about one-fourth in Chicago. Dextrose prices were about 2.5 percent higher in September than in April.

If corn sweetener prices remain near recent levels for the remainder of the year, dextrose prices for 1979 will average about 5 percent higher than in 1978 while fructose sirup prices will be up about 10 percent. Similarly, glucose sirup prices, would average around 15 percent higher in the Northeast and 30 percent higher in the Chicago-West marketing territory than in 1978. Corn sweetener prices could soften slightly later this year or early next year as HFCS and glucose corn sirup demand declines seasonally.

Corn prices have strengthened significantly this year. Prices of No. 2 yellow corn averaged \$2.78 per bushel in August, about 30 percent above September 1978. However, corn sweetener producers have at least partially offset higher corn costs with higher prices for corn wet milling byproducts. Corn oil prices were up nearly 3 percent from January. Corn gluten feed prices (21 percent protein) were up nearly a 10th while corn gluten meal (60 percent protein) prices were about a fourth higher than in January.

The U.S. wet milling grind in calendar 1979 is expected to range between 430 to 440 million bushels, up sharply from 400 million last year. Over two-thirds of the recovered starch will be processed into corn sweeteners, with the remainder sold as corn starch and dextrin.

Total domestic shipments of corn sweeteners for food use this calendar year are expected to total over 4 million short tons (dry basis—DB), up sharply from 3.56 million in 1978. Most of the increase in corn sweetener sales is coming from a spectacular increase in high fructose corn sirup (HFCS) though sales of corn starch and glucose corn sirup also increased.

HFCS sales for the first 8 months of 1979 were reportedly up 40 percent over the same period in 1978. At this high pace, sales in 1979 would reach 1.6 to 1.7 million tons (DB), up sharply from 1.25 million last year. Use in beverages, accounting for about 40 percent of total fructose sales, was reportedly up 50 percent for the first 8 months this year compared with the same period in 1978.

Glucose corn sirup shipments are expected to rise to 2.05 million tons (DB) from 1.97 million in 1978, but dextrose shipments for food use will likely ease to around 425,000 tons from 435,000 in 1978.

Per capita consumption of corn sweeteners is expected to total nearly 38 pounds (DB) this year, up from about 34 pounds in 1978, with most of the increase in fructose sirup. Fructose sirup consumption may total 15 pounds (DB) compared with 11.5 pounds in 1978. Glucose sirup consumption is estimated at 18.5 (DB), up slightly from 1978. Per capita dextrose consumption is expected to fall to 4.2 pounds this year, continuing the decline that began in 1976.

Other caloric and non-caloric sweeteners

Honey production in 1979 may be down slightly from the 230 million pounds produced last year. The estimate for commercial producers in 20 States with 300 or more colonies is down 2 percent from last year's output. There was a 2-percent increase in commercial producer colony numbers but the expected yield of 74.1 pounds per colony is off 4 percent. Demand appears to be good with producers receiving 6 cents per pound more than last year. Imports are running behind last year's pace and may total 55 million pounds in 1979 down slightly from 56 million pounds in 1978. U.S. exports may about equal 1978's 10 million pounds. Total 1979 domestic disappearance of honey will likely decline about 5 percent.

U.S. maple sirup production at 1.22 million gallons in 1979 is up 6 percent. Imports for the first 7 months of 1979 totaled 7 million pounds, an increase of 3 percent from the first half of last year.

The noncaloric sweetener situation continues in an unsettled state since cyclamate was banned for domestic food and beverage use nearly a decade ago. Cyclamate continues to be banned but according to the Food and Drug Administration (FDA), hearings will be reopened "to consider some specific questions about the safety of the artificial sweetener that were not adequately addressed." Saccharin continues to be available for use in foods and beverages. On July 24, the House of Representatives voted to extend until June 30, 1981, the moratorium that prevented the FDA from banning saccharin. The Senate has not yet considered saccharin and the FDA has indicated it will not ban saccharin while the Congress is actively evaluating it.

The FDA will convene a public board of inquiry on aspartame later in 1979; no specific date has been set. FDA denied the major manufacturer's recommendation that aspartame be allowed on the market while the board proceedings are taking place.

THE SWEETENER OUTLOOK

Domestic raw sugar prices in 1980 will continue to be chiefly influenced by world sugar prices and U.S. sugar policy. Recent strength in the world price seems likely to continue into next year, especially if the United States ratifies the International Sugar Agreement. World prices already have been buoyed by prospects of 1979-80 world production below consumption and reportedly, speculation in sugar as a hedge against inflation.

With the import fee on raw sugar at zero, and a domestic market price objective of 15 cents, further increases in the world price can be expected to be directly reflected in the U.S. price. Unless the world price falls sharply in the fourth quarter, averaging below 10.29 cents per pound for 10 consecutive market days, the raw sugar fee will remain zero for the rest of 1979. In addition, unless the world raw sugar price averages below 11.29 cents during the 20 market days preceding December 20, 1979, we will begin the first quarter of 1980 with no import fee on raw sugar. This assumes no change in the market price objective and no change in the import duty.

The sugar bill, voted down by the House of Representatives in October, would have set the market price objective at 15.8 cents per pound (raw value) for the 1979 sugar supply year beginning October 1, 1979. The Secretary of Agriculture has general authority even without this legislation to change the market price objective. The Secretary however, remains constrained by the 50-percent ad valorem limit on the import fee used to protect the price objective from decreases in world prices.

The interim sugar program, announced by the Secretary of Agriculture while sugar legislation was pending, continues to govern the 1979 crop. This program specifies loan rates of 13 cents per pound for raw cane sugar and 15.15 cents per pound for refined beet sugar. Loan rates for 1978-crop sugar were 14.73 cents for raw sugar cane and 16.99 cents for refined beet sugar.

Wholesale and retail prices for sugar in 1980 are expected to follow changes in the domestic raw price. Demand for sweeteners will not likely suffer from the expected economic downturn. Sweeteners and sweetener-containing products are believed to be relatively income-inelastic within the range of consumer incomes expected. Sugar, however will continue to face competition from corn sweeteners and per capita sugar consumption may fall 1 to 2 pounds in 1980.

Domestic production of sugar in the 1980-81 crop year may not differ much from this year's. Sugarcane acreage for 1980 harvest is largely planted and is expected to produce a crop about the same size as in 1979-80. The first official indication of sugar beet acreage will come in the January Prospective Plantings report. Sugar beet growers have more flexibility than cane growers in switching to other crops. However, given recent price strength and barring additional plant closings, 1980-81 production may be about the same as in 1979-80. Sugar growers will face higher production costs in 1980 but so will growers of other crops.

Sugar processed in calendar 1980 will come partly from the 1979-80 crop and partly from the 1980-81 crop. Because 1979-80 best produc-

tion is down, less contribution is expected from that crop to calendar 1980 production than was made to calendar 1979 production from the 1978-79 crop. Calendar year 1980 production thus may decline around 3 percent. With these expectations for production and consumption in calendar year 1980 and for beginning stocks of around 4.1 million tons, imports in 1980 could run about 4.7 million tons. This would give 1980 ending stocks of around 3.7 million tons, about the same as ending stocks in 1978.

Corn sweetener prices seem likely to increase further in 1980. High fructose corn sirup (HFCS) prices will continue to be largely determined by the price of sugar, a close substitute in many industrial uses. However, corn sweetener prices will also be influenced by higher prices for corn, energy, and other inputs in 1980. Increased costs stemming from higher input prices could cause sugar-HFCS price differentials to narrow.

The corn wet milling grind is expected to total around 465 million bushels in 1980. Present trends suggest HFCS sales could approach 2 million short tons (dry basis, db). This would be an increase of about 20 percent following an increase of around one-third this year. Glucose sales for food use may be up slightly to around 2.1 million tons (db). Dextrose shipments for food use are expected to total about the same as in 1979.

OUTLOOK FOR COFFEE, TEA, AND COCOA

Coffee

The U.S. average retail price for roasted coffee in September 1979 was \$3.28 a pound up 25 percent from the May 1979 price. The May average, \$2.62 a pound, was the low point of 23-month-long period of declining retail coffee prices. Recent higher retail prices reflect increases in wholesale roasted and green coffee prices. Wholesale prices were up from \$2.31 a pound in April to \$3.05 in September. Green prices started rising in March, before the Brazilian freeze, reportedly because of growing demand, particularly in Europe and Japan. Following news of the May 30-June 1 freeze in Brazil, affecting the prospects of the 1980-81 crop, green prices rose faster reaching \$2.04 a pound in September compared with the February low of \$1.31.

Green and wholesale roasted coffee prices may not change much from current levels until there are further indications about the size of the 1980-81 crop and prospects for the 1981-82 crop. Harvest of the 1980-81 crop in Brazil is expected to begin in May. Danger of frost damage in Brazil continues through August. U.S. retail coffee prices probably have not yet reflected all of the increase experienced in green and wholesale prices. Thus, retail coffee prices are likely to increase further and reach a U.S. average of \$3.25 to \$3.60 per pound over the next several months.

Per capita consumption of coffee in the fourth quarter of 1979 is expected to decline slightly from the level of the same period last year. However, gains made in the first three quarters will be more than offsetting. Consumption for calendar 1979 is estimated at 11.5 pounds (green bean equivalent, GBE) per capita, up about 1 pound from 1978. In 1980, per capita use will do well to equal the 1979 level. With the sharp rise in prices in 1977, per capita consumption dropped 3.4

pounds (GBE). The U.S. average retail price that year reached a record \$3.94 per pound. Prices this time are not predicted to jump as sharply but some consumers can be expected to reduce consumption. Moreover, U.S. per capita coffee consumption was trending down before the sharp falloff in 1977 and this longrun downtrend could resume in 1980.

U.S. imports of coffee (green and processed) for the first 8 months of 1979 totaled 1.78 billion pounds, up 12 percent from January–August 1978. A continuation of recent trends through September with a slight falloff in the last quarter suggest that 1979 imports will total around 2.6 billion pounds (GBE) up from 2.45 billion in 1978. With coffee consumption likely to decline in 1980, roastings and imports can also be expected to decline.

Tea

U.S. tea imports totaled nearly 111 million pounds during January–August 1979, compared with 109 million during the same period in 1978. The level of tea imports ran behind the 1978 pace earlier this year, as the then-declining coffee prices and somewhat higher tea prices apparently discouraged tea use. However, with rising coffee prices, both tea imports and use may pick up in the last quarter of 1979. Calendar 1979 tea imports now seem likely to exceed the 1978 level of 152 million pounds and total 160 million to 170 million pounds.

Retail tea prices increased slightly in 1979. A pack of 48 tea bags cost \$1.43 in New York City in September, up from \$1.38 in January and \$1.36 in September 1978. The increase in retail tea prices reflects increased handling, packaging and distribution costs. Wholesale tea prices have not increased in recent months.

Tea imports in calendar 1980 seem likely to at least match this year's prospective level of 160 to 170 million pounds. There could be some pickup in tea use, as some coffee drinkers react to higher coffee prices, and switch to tea.

Wholesale tea prices are not expected to change much from current levels into early 1980. They have been relatively stable this year despite an expected drawdown in global stocks. Retail tea prices may increase next year but probably less than the general rate of inflation.

Cocoa and chocolate

U.S. cocoa bean imports totaled 294 million pounds through August of 1979, down 11 percent from the same period last year. Imports of semiprocessed products totaled 256 million pounds (cocoa bean equivalent—CBE), 11.5 percent less than last year. In the semiprocessed products category, cocoa butter imports were up nearly a fourth, unsweetened cocoa powder imports were down nearly 30 percent, and imports of unsweetened chocolate were largely unchanged. Imports of consumer cocoa and chocolate products continue relatively insignificant, at around 3 million pounds (CBE) for the first 8 months of both 1978 and 1979.

Cocoa bean imports in 1979 now seem likely to total between 400 and 440 million pounds, compared with 470 million last year.

The U.S. cocoa bean grind in 1979 is now expected to increase slightly over last year's nearly 360 million pounds. Significant expansion in the second and third quarter brought the grind to about 13

million pounds ahead of last year's pace for the first 9 months. Even with a slight falloff in the fourth quarter, the calendar 1979 grind could total near 370 million pounds.

Based on 8 months of data, total 1979 domestic use of cocoa and chocolate products appears to be slipping from last year's 744 million pounds (CBE). Per capita consumption of cocoa and chocolate is likely to decline from 3.4 pounds in 1978 to around 3.2 pounds.

New York cocoa bean prices (the average of the nearest three active futures trading months on the New York Cocoa Exchange) average \$1.39 a pound in the third quarter, down from \$1.47 in the second quarter and \$1.56 in the first quarter. The decline from the 1978 average of \$1.53 per pound has been caused largely by: (1) indications from around the world as early as last April, that the 1979-80 world cocoa crop had the potential to be large and (2) that while cocoa prices have softened, prices continue to be sufficiently high to discourage consumer demand and expansion of the U.S. cocoa grind. As prospects firmed for a record crop in 1979-80, cocoa bean prices declined from \$1.48 a pound on October 1 to \$1.25 on the 25th.

With more plentiful cocoa supplies and lower prices in prospect, cocoa imports and grindings are likely to increase some in calendar 1980.

Retail prices of cocoa and chocolate products may increase some next year. Lower cocoa bean prices will have little if any net impact on retail prices. Manufacturers are still using relatively high-priced cocoa inventories and other costs can be expected to rise with the general rate of inflation. Per capita consumption may be about the same as in 1979, with total consumption up about in line with expected population growth.

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(By James E. Agnew, Jr., Deputy Director, Procurement and Sales Division, Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture)

We are all well aware of the uncertainties brought about by the failure of the Congress to pass sugar legislation. The question that seems to be foremost in everyone's mind in recent days concerns the level of price support that may or may not be provided the domestic sugar industry under existing statutory authorities. I don't know the answer to this question. However, in view of the administration's stated commitment to the maintenance of a viable domestic sweetener industry, I can say that the ratification of the ISA as well as the matter of providing adequate support to producers are areas of chief concern within the Department of Agriculture. Perhaps the policy picture will become clearer in the coming weeks, but today I am not going to make any statements that will add fuel to the speculative fire.

Sugar sales policy also generates a lot of questions and is not totally understood by many. Therefore, I would like to briefly outline the Commodity Credit Corporation's current sales policy for raw cane sugar.

I. STATUTORY REQUIREMENTS AND BACKGROUND

Agricultural Act of 1949—Section 407: "The Commodity Credit Corporation may sell any farm commodity owned or controlled by it at any price not prohibited by this section. In determining sales policies for basic agricultural commodities or storable nonbasic commodities, the Corporation should give consideration to the establishing of such policies with respect to prices, terms, and conditions as it determines will not discourage or deter manufacturers, processors, and dealers from acquiring and carrying normal inventories of the commodity of the current crop. The Corporation shall not sell any basic agricultural commodity or storable nonbasic commodity at less than 5 per centum above the current support price for such commodity, plus reasonable carrying charges. * * *"

Agricultural Act of 1956—Section 201 (a) : "The Commodity Credit Corporation shall, as rapidly as possible consistent with its existing authority, the operation of the price support program, and orderly liquidation, dispose of all stocks of agricultural commodities held by it."

The sections of the two laws quoted above constitute the statutory basis for the prices at which sound storable nonbasic commodities owned by CCC may be sold. The most important statutory pricing factor is the requirement that the sales price be at least 5 percent above the current loan rate with a further addition for carrying charges.

II. DOCKET REQUIREMENTS

In line with these statutory requirements, a CCC board docket (docket CZ 200, revision 4) prescribes the general policy governing all types of dispositions by CCC, including sales to the private trade. The docket contains the following specific requirements, in brief, on the prices at which sound commodities can be sold:

1. Prices shall be in conformity with statutory requirements as to minimum prices.

2. Consideration shall be given to such factors as cost of carrying the commodity, quantity on hand and to be sold, and market prices.

3. Consideration shall be given to establishing prices that discourage manufacturers and dealers from relying on CCC stocks rather than carrying normal inventories of the current crop.

4. Prices shall not unduly interfere with the support program, depress farm prices or income, or result in losses not offset by program advantages.

5. Prices shall not reflect less than market prices.

III. POLICIES AND PROCEDURES FOR THE UNRESTRICTED USE SALE OF SOUND 1977 CROP RAW SUGAR

A. Storability.—Sugar is treated as a storable nonbasic commodity with the restrictions of section 407 of the Agricultural Act of 1949, as amended, applicable to all sales of sound quality sugar for unrestricted use.

B. Point of Delivery.—Sales FOB buyers' conveyance at the storing warehouse are generally made. At the option of the buyer, sales for delivery in an instore warehouse position may be made. If sold instore, credit will be given against the FOB conveyance price to reflect the cost of loading-out and weighing.

C. Time of Delivery.—Sales for unrestricted domestic use are made at buyer's option for delivery instore with buyer taking immediate title with no load out period specified or for delivery into buyer's conveyance within 30 days from the date of the sales contract.

D. Minimum Sales Price.—Sales of sound quality sugar for unrestricted use are made at the higher of (1) the prevailing average market price as determined by CCC for the 5 market days preceding consideration of bids or (2) the national market price objective, at the point of delivery and time of acceptance of offers, but at not less than a statutory minimum sales price of \$13.78 per hundredweight.

The minimum sales price includes 13 cents per hundredweight for reasonable carrying charges. Carrying charges include only those costs which occur regardless of when sugar is delivered to a buyer. These costs, for CCC, are loading out, weighing, and sampling.

E. Location Basis for CCC Sales.—Raw sugar is imported and purchased at a basis price for standard quality, duties and fees paid, delivered and unloaded at destination. Daily domestic market prices quoted by the New York Coffee and Sugar Exchange and the current market price objective are stated in terms of standard quality raw sugar; duties and fees paid, delivered and unloaded at points north of Hatteras.

F. Price Basis of CCC Sales.—A commercially accepted “96-degree basis premium and discount” system for sugar polarization was adopted for CCC sales so that CCC can compete on equal terms with other sugar sellers. Although not universal in the trade, considerable quantities of sugar are sold on a premium and/or discount system for ranges considered to be standard. In order to relieve any uncertainties regarding the quality of CCC sugar, it was determined that CCC should guarantee that the quality of its sugar is at least “standard.” Therefore, commercially accepted “discounts” will be applied to the basis price for such quality factors as moisture, ash, grain size, and color if any of those factors are below standard. A “premium” system for quality factors other than polarization is not used.

G. Evaluation of Bids in Terms of Market Price.—Quoted market prices are based upon CIF destination north of Hatteras. Standard discounts are made for deliveries to points south of Hatteras and gulf ports because of differences in transportation and unloading costs. In any case, the FOB bid price, if it first meets the statutory minimum sales price is evaluated in terms of the existing market price at the point of destination of the sugar. A bid must meet this test.

Bidders are required to certify destination of the sugar. On the date of bid consideration, CCC compares the FOB price, plus estimated costs of transporting the sugar to destination, with the average CIF market price at destination for the 5 market days preceding the date of bid consideration. In addition to the direct costs incurred in transporting sugar to destination, consideration is also given to the interest, transit loss, and administrative costs which may be incurred by the buyer. In the trade, these are items that are either covered by brokerage or are borne by the seller. They are identifiable costs unique to CCC's FOB origin sales. If the bid, CIF equivalent, after taking into account such costs, does not at least equal the applicable market price, the bid is rejected.

SUGAR: A LONG-TERM PERSPECTIVE*

(By Jos de Vries, Commodities and Export Projections Division, World Bank)

INTRODUCTION

Our ideas about the future of a market are often largely determined by the state of the market at the present time. That is one of the reasons why futures prices and spot prices move in nearly perfect unison. It is also the main cause of the boom-bust cycle that characterizes the markets for most of the commodities that show a considerable lag between the investment decision and the resulting production increase.

The tendency to adjust our ideas about the future to the current ups and downs of the market is understandable. It feels more comfortable to project high prices when actual market prices are high and increasing than when they are low and declining. Nevertheless, anybody trying to make long-term projections should resist these temptations. Therefore, we shall avoid references to current market trends, and base our projections solely on the long-term trends in the sugar market that can be observed in the past, and on assumptions about changes that might occur in these trends in the future.

In what follows we will first review some of the main characteristics and developments of production, consumption, trade and prices in the world sugar economy. These characteristics and developments form the basis of the assessment of the long-term outlook that will follow this discussion.

PRODUCTION

One of the clearest differences between agriculture in developed countries (including Eastern Europe and the U.S.S.R.) and in developing countries is the difference in productivity. The productivity of land for most crops is 50 percent to 80 percent higher in developed than in developing countries. However, there are exceptions, particularly sugar and vegetable oils. In both of these commodities developing countries obtain a higher yield per unit of land than do developed countries because the climate allows them to produce the same end product from a different crop. In the case of sugar most of the production of developed countries comes from beets (average yield per hectare is about 31 metric tons of beets or about 4 metric tons of sugar) while developing countries derive most of their sugar from cane (average yield 54 metric tons of cane or about 5 metric tons of sugar per hectare).

* The views expressed in this paper are those of the author, and not necessarily those of the World Bank. Many of the observations made are based on an econometric study of the world sugar economy by the author.

The above implies that developed countries have a strong comparative disadvantage in the production of sugar. They produce 60 percent more cereals per unit of land than do developing countries, whereas in sugar they produce 20 percent less.¹ That developed countries nevertheless produce, and in some cases even export, substantial quantities of sugar is mainly due to heavy protection. The distribution of sugar production over the world is shaped by political rather than by economic considerations.

Despite the tendency of developed countries to protect their sugar growers, there still remains a role for economic forces. In the struggle for higher support prices, larger production quota or stiffer import duties the state of the world sugar market determines the light in which these requests are considered by policymakers and consumer lobbies: It certainly makes a difference whether a metric ton of sugar f.o.b. Caribbean costs \$42, as in 1968, or \$654, as in 1974. Domestic sugar prices do reflect these trends, but because of the political interference they do so only to a limited degree. The effect is that sugar production is less responsive to world market prices than the production of most other crops, and that, in consequence, the price swings needed to balance supply and demand are larger.

If we look at the course of production over the past 20 years we can clearly see its response to price, which occurs with an average lag of about 3 years. It took from 1956 to 1963 to add 12 million tons to world production. The next 12 million tons were added in less than 3 years, stimulated by the price peak of 1963. Again, it took from 1966 to 1974 to add 14 million tons. Only 3 years later, in response to the record prices of 1974, another 14 million tons had been added. This price-investment cycle was not restricted to countries where sugar prices were more or less free. Actually, the strongest response to the 1974 price peak occurred in the EEC, one of the most highly controlled agricultural markets outside the centrally planned economies.

Over the past 20 to 25 years the geographical distribution of sugar production has not changed very much. In the mid-1970's, just as in the mid-1950s, about 50 percent of the world's production came from developing countries, 30 percent from the developed market economies and 20 percent from the centrally planned economies. In this period most of the increases in the production of cane sugar have come from increases in the area under sugarcane, whereas most of the increases in the production of beet sugar have come from increases in yields.

CONSUMPTION

There are three factors that influence per capita consumption of sugar: incomes, prices, and per capita production. The first two factors are familiar. The last factor may seem somewhat unusual, but is quite common outside the high income countries, and is an example of Say's law that supply creates its own demand. At given income levels, per capita consumption in net exporting developing countries is much higher than that in net importing developing countries. It is important to keep this in mind when evaluating the effects of pro-

¹ The figures are 120 percent more and 15 percent more respectively if Eastern Europe and the U.S.S.R. are excluded from the developed country group.

duction expansion in net importing developing countries: domestic consumption will almost certainly rise much more rapidly than could be expected on the basis of incomes and prices alone, and thus export availabilities will be less—or remaining import requirements will be larger—than at first sight might be expected.

Sugar producers are not the only ones that benefit from protection; in some countries, sugar consumers are protected at the expense of producers. This is often the case in developing countries, where the urban consumer is more vocal in the defense of his interests than the rural producer. In net exporting countries, where producers first have to supply the domestic market at low prices before they are allowed to export, consumption often is totally unresponsive to changes in world market prices. In net importing countries, however, at least part of the domestic supplies have to be bought at world market prices, and in these countries changes in world market prices do have a measurable impact on consumption.

As far as the relation between income growth and sugar consumption is concerned there are three distinct patterns. In the developed countries the market is becoming saturated: per capita consumption is virtually stagnant, and in North America and in parts of Northwestern Europe it has begun to decline slightly. In the next decade, growth in per capita consumption in Eastern Europe and the U.S.S.R. will almost certainly come to a halt. Only in Southern Europe will per capita consumption continue to increase, albeit at a declining rate.

A large number of sugar producing developing countries consume about as much sugar per capita as do the developed countries, but the evidence of a decline in their rate of growth of per capita consumption is much weaker. This can only mean that sugar is an inferior good in these markets. People with low incomes turn to sugar not because this is their ultimate desire, but because it is a relatively cheap source of energy. Thus, the saturation level of these markets may be higher up to a certain level of income. After that level per capita consumption of sugar will start to decline fairly rapidly as income rises, but this is a stage not likely to be reached in the next decade. Per capita consumption is still clearly rising in almost all producing developing countries, and although income elasticities of demand are declining, they are still very far from being negative.

The final group of consuming countries to be distinguished is the low income importing countries, where per capita consumption is well below the world average of 20 kilograms per year. Here there is no evidence of any decline in the responsiveness of consumption to income growth. Rather, consumption growth shows a tendency to accelerate with increasing incomes.

The different evolution of sugar demand in the various groups of countries has led to marked shifts in the distribution of world sugar consumption. Developed market economies, which accounted for over half of the world's sugar consumption in the 1950s, today account for less than 40 percent. The share of Eastern Europe and the U.S.S.R. increased from 15 percent in the 1950s to 20 percent in the 1960s, but since then it has not increased any further. Developing countries (including centrally planned Asia) today consume about 40 percent of the world's sugar, against 30 percent 20 years ago.

TRADE

Unlike consumption, there has been no major change in the distribution of production, and as a result the directions of trade have changed. Over the past 20 years the net import requirements of the developed market economies have declined not only in relative, but even in absolute terms. Eastern Europe (including the U.S.S.R.) has turned from a small net exporter to a large net importer. And the net exports of the developing countries have nearly doubled.

As a whole international trade as a percentage of production has declined from 35 percent in the mid-1970s, mainly because of the increased self-sufficiency of the developed market economies.

PRICES

The price of sugar fluctuates more than the price of any of the other 40 odd commodities that are important as export products for developing countries. The price of sugar increased by 1,450 percent between 1968 and 1974, or 650 percent if account is taken of the effect of inflation. In 1978 the price had declined again to only 17.5 percent of the price received in 1974 in real terms.

The reason most often given for the volatility of sugar prices is the residual character of the free market. This is only a partial truth. The main reason is that national sugar markets are insulated from the world market by domestic sugar policies. This prevents a quick adjustment of production and consumption to the world market situation, and carries a disequilibrium far beyond the one that would have arisen in a free market. World prices reached an all time high in 1974, but domestic consumption in net exporting regions kept on increasing—from 18.9 million metric tons in 1973 to 20.8 million metric tons in 1975, compared to a decline from 59.8 to 56.6 million metric tons in importing regions over the same period.¹ Had consumer prices in net exporting countries risen more in line with world market prices the latter would have been lower. Prices in 1977 and 1978 declined to less than one-fifth of what they were in 1974, in real terms, but this has not prevented the EEC from becoming a large net exporter in these years. Had the price received by EEC exporters not been fully insulated from the world market price by export subsidies, world prices would undoubtedly have been less depressed in 1978.

In the past, sugar prices in real terms have shown a definite cyclical pattern, with the most recent peaks occurring in 1963 and in 1974. The peaks in the 1950's were relatively moderate, and the ensuing depressions were therefore shortlived. Prices in 1963 rose much higher, and by consequence the response of production was stronger, prices declined more drastically, and the depression lasted longer. In 1974, prices rose to record highs, and we are now experiencing the consequences of this.

Before we turn to the prospects, one last observation on prices should be made. In the 1965-68 period the price of sugar in 1979 terms was US\$6/lb. The price reached in 1977-78 (again in 1979 terms) was

¹ The consumption figures are based on a division of the world into 26 regions, as used in our projection model. The figures might change slightly if different regional groupings were to be used.

25 percent higher, despite the fact that aggregate world stocks as a percentage of world consumption were higher. This can be explained by two factors. First, there is the weakness of the U.S. dollar. Since 1970 the dollar has depreciated nearly 20 percent more with respect to the SDR (a basket of currencies in which the dollar itself has a weight of one-third) than could have been expected on the basis of differentials in inflation rates alone. This means that, whereas in real dollar terms the sugar price in 1977-78 was 25 percent above the 1965-68 price it was only about 5 percent above the 1965-68 price if measured in terms of the real value of a basket of major trading currencies. Second, there seems to have been a slow but steady rise in the real costs of sugar production in almost all countries. This could explain why, even after correction for the change in the real value of the dollar as compared to other major trading currencies, the price in 1977 was still above the levels reached in the late 1960's.

PROSPECTS

We have spent what may seem rather a long time in discussing the past for a paper dealing with the future. The reason is that we can never judge a projection as such. Who can argue with a projection of world sugar production of 122 million tons in 1980, world consumption of 119 million tons, and world trade of 33 million metric tons at a price of US\$16/lb in 1979 terms? The only way of judging a projection is by judging the assumptions, and the assumptions are based on observations of what has happened to the sugar market in the past and on likely changes in trends in the future.

Based on the interaction of production, consumption, and prices as observed in the past, there is little doubt in our mind that sugar prices will reach a new peak somewhere around 1983-84. Prices will probably exceed US\$20/lb in 1979 terms over this period, but whether the actual peak will be 25, 30, or even 40 cents a pound is anybody's guess. With equal probability, prices will decline again afterward because of new production increases stimulated by the high prices. The situation 10 years from now may be similar to that today: the worst part of the recession is behind us, but large stocks still hang over the market, preventing any more than moderate price increases in the coming 1 or 2 years.

In the 1980's, consumption growth in the developed market economies and in Eastern Europe and the U.S.S.R. is bound to be very slow indeed, probably less than 1.5 percent per year. This means that by 1990 the whole of the developed world will consume less than 50 percent of the world's sugar. The strongest growth in consumption is almost certainly going to come from the developing regions in Asia and Africa that are at the bottom of today's per capital consumption scale. Together, Africa and Asia (including the People's Republic of China) may account for as much as half of the expected increase in world consumption between now and 1990.

Where will the increase in production come from? Among the developed countries, increases are foreseen only in Australia, South Africa, and Southern Europe. Production in Eastern Europe and the U.S.S.R. is so costly that, given their commitments to buy Cuban sugar, they are not expected to increase their own output substan-

tially. Production in the EEC is not expected to expand very much, either. It is one thing to increase high cost production when a country is a net importer, and producer subsidies only show up as higher consumer prices. It is quite another thing to expand this production once the country is a net exporter, and each million tons added may show up as a \$300 million to \$400 million expenditure item in the budget. And, based on past responses, we do not anticipate other than a marginal increase in U.S. production toward 1990.

The implication of the above is that the larger share of the production increase (we expect about two-thirds) is going to come from the developing countries. The increase will come from two different groups. First, there are the low income, low consumption countries in Asia (including the People's Republic of China) and Africa. Of these countries, only one thing can be predicted with some certainty: They will not become large sugar importers (oil producers like Nigeria are a possible exception), simply because they cannot afford to spend too much of their scarce foreign exchange on what is, in a sense, a luxury item on their import bill. Thus, although these regions are most promising in terms of growth in consumption, they are not necessarily promising from the point of view of trade. The growth of consumption in these countries will depend crucially on the growth in their domestic production.

The second group of developing countries, where production can be expected to increase, is the nontraditional exporters, countries that have just come to know their own potential, like Thailand and Brazil. Such countries are, of course, not expanding their production at the present time, but during the next price boom they will almost certainly respond much more strongly than countries such as the Philippines, Taiwan, or the Dominican Republic, where production has clearly stagnated.

This leaves us with the question as to what will happen to trade. We do not expect the downward trend in trade as a percentage of total production to continue. This trend was mainly due to the increasing self-sufficiency in both Eastern and Western Europe, and we believe that the limits here are close to being reached. The self-sufficiency of the developed market economies as a group will still increase, but this will not reduce world trade, since most of the increase in production is expected to take place in the net exporting countries, rather than in the net importing countries, as was the case in the past.

We have already dealt with the price prospects by indicating that the cyclical pattern is bound to continue. There are two additional questions that we want to address. First, are prices in future going to be more or less volatile? Second, if one abstracts from the cycle, will the trend in real sugar prices be up or down?

The world market price of sugar will always remain highly volatile, for reasons already mentioned. But the enormous differences between prices in boom and in bust years that we have seen in the past will not necessarily return. We expect this because production levels in the two regions with the highest production costs, and therefore with the most insulated markets, have stabilized. The largest production increase in the mid-1960s occurred in the Soviet Union. The Soviet Union is still a net importer, but its commitments to buy Cuban sugar leave it with a

small exportable surplus after these commitments have been honored. The largest production increase in the mid-1970's came from the EEC. The EEC is now a net exporter, and will hardly be able to repeat such a performance. Therefore, we expect that the sugar market will be spared some of the extreme experiences of the past in the coming decade. Developing countries may respond to prices just as much as developed countries have done. But developing countries are not, and cannot afford to be, committed to maintaining high production levels in the face of low world market prices. They are more liable to cut back production when prices decline, thus allowing for a speedier adjustment of supply to demand, a less lengthy and painful depression, and a milder upswing afterward.

As to the second question, we believe that the long-term trend in sugar prices is slightly upward. Statistical analysis has shown that in most countries (with Brazil and Thailand notable exceptions) the price level at which the increase in production will match the increase of consumption has been slowly rising since the 1960's. This was due partly to the weakening of the U.S. dollar, and partly to an increase in the real costs of production. Even if we assume no further decline in the real value of the U.S. dollar in terms of other major trading currencies, sugar prices will probably continue to edge upward in the longrun, and, in 1979 dollar terms, whereas the low in prices was US¢6 in 1965-68 and US¢8 in 1977-78, it might well be US¢10 in 1987 or thereabouts.

214 OUTLOOK FOR TIMBER PRODUCTS [3]

(By Robert B. Phelps, Forest Service, U.S. Department of Agriculture)

Few timber products are consumed by individuals in the form in which they are manufactured. Instead, most move to various major markets where they are remanufactured or made a part of a product that is ultimately used by individual consumers. Thus, although consumer demand is the underlying force, direct demand for timber products is largely determined by the levels of activity in their primary end-use markets. So before discussing demands for the various products, I would like to briefly review trends in these markets and take a look at current estimates of their strength this year and early in 1980.

DOMESTIC MARKETS

The gross national product, the most comprehensive measure of total economic activity, grew at an annual rate of 2.4 percent (measured in 1972 dollars) in the third quarter of 1979, a sharp reversal of the 2.3 percent drop recorded during the second quarter. With these essentially offsetting trends, however, there was little real growth since the 1.1 percent registered in the first quarter. Moreover, the gain in the third quarter was largely due to increases in consumer spending, financed in part by savings, giving the economy an impetus that analysts feel is not likely to be repeated in the months ahead. As a result of these trends and other factors such as continuing high rates of inflation and increasing interest rates, most Government and private economists forecast some decline in the real gross national product in the fourth quarter. Many also feel that there may likely be little sustained improvement before the second quarter of 1980 but that the average for the year will be somewhat above that for 1979.

A key determinant of the demand for many timber products is construction activity, and most particularly, residential construction activity. Housing is the Nation's most important market for softwood lumber and plywood, and a major consumer of many other timber products such as hardwood plywood, particle board, and insulation board. And not only is it a large direct consumer of wood, but it provides the stimulus for homeowner purchase of many manufactured goods, including household furniture. Furniture production of course, is a key manufacturing use of hardwood lumber, plywood and veneer, hardboard, and particleboard.

In 1978 new housing starts rose to just over 2 million units, the largest annual total in 5 years, and a continuation of the generally rising trend since 1975. This year, however, there were sharp declines in January and February, primarily due to weather related factors, and

although housing starts rebounded in March, they have not returned to year-earlier levels. Preliminary data indicate that the seasonally adjusted annual rate of new private housing starts during the first three-quarters of 1979 was about 1.76 million units, 11 percent below the 1.97 rate for the first three-quarters of 1978. A somewhat smaller percentage of the units started so far in 1979 have been single-family. This has special significance for the timber industries because wood products use in single-family units is normally much larger than in other types of housing. Placements of mobile homes or residential use in 1979 have also been below 1978 levels.

Despite the fact that the seasonally adjusted annual rate of both housing starts and permits rose in September, a number of factors, including rapidly rising interest rates, especially since the Federal Reserve Board's move to tighten credit markets in early October, continued slowing of savings flows into savings institutions, declines in real personal income, and continued high sales prices for finished dwelling units, are likely to adversely affect housing starts in the months ahead. Most analysts now expect some decline in the fourth quarter, with total starts for the year amounting to about 1.65 million units. The forces affecting housing are expected to continue into 1980, however the extent and duration are a matter of some conjecture by housing analysts. Most forecasts indicate a further drop in early 1980 to an annual rate of 1.2 to 1.3 million units with some recovery later in the year. Starts for the year have therefore been estimated at about 1.4 million for purposes of this analysis. A somewhat larger proportion of the units are expected to be in multifamily structures than in 1979. Mobile home shipments are likely to follow similar trends.

Expenditures for residential upkeep and improvements have been increasing slowly in 1979 as many homeowners apparently met their housing needs by alterations and remodeling rather than purchase of new homes. Expenditures in the second quarter of the year were at a seasonally adjusted annual rate of \$40.9 million, just slightly above the first quarter expenditure level, but about 7 percent more than in the second quarter of 1978. A continuation of this slowly rising trend can probably be expected in the last half of the year, and into 1980 if the economy moves as discussed earlier.

In contrast to housing, nonresidential construction activity continued up during the first half of 1979. At midyear the seasonally adjusted annual rate of construction expenditures—measured in 1972 dollars—was 7 percent above 1978. Expenditures for private buildings, the most important wood using segment of nonresidential construction, was up almost 15 percent. The outlook for the coming months is mixed. The seasonally adjusted index of contracts for future nonresidential construction was showing a downward trend at midyear. Business plans for new plant and equipment expenditures, however, indicated continuing increases in the last half of the year and into 1980. On balance, and in light of recent credit developments, new nonresidential construction expenditures seem likely to show little rapid growth until the second half of 1980.

Industrial output—an important indicator of the demand for pallet lumber, container board, and some grades of paper—increased slowly through the first 9 months of 1979 rising from an index value of 146.6

[1967=100] in December 1978 to 152.3 in September. Container production, a large market for paperboard, hardboard, veneer, and some grades of lumber, was following the same trend. Output of the furniture and fixture industry—a major end-user of hardwood lumber, plywood, and veneer, and of particleboard, and hardboard—was 3 percent above 1978 after the first 8 months of the year. Many analysts expect that growth in most of these important wood products markets is likely, to remain slow until the second half of 1980.

INTERNATIONAL MARKETS

The United States is the world's leading importer of timber products—chiefly lumber, woodpulp, and paper and board from Canada and veneer and plywood from Southeast Asia. The total value of these imports in 1978 was \$7.9 billion or about 4.6 percent of the value of all U.S. imports. In terms of roundwood equivalent, about one-fifth of our apparent consumption of timber products has been imported in most recent years. The United States is also a major timber products exporter. In 1978, the total value of timber products exports was about \$5 billion—some 3.5 percent of our exports. Although we ship a variety of wood products to many countries, our principal export markets are Japan for softwood logs and lumber, pulp chips, woodpulp, and paper and board products, and Western Europe for woodpulp, paper and board products, and smaller amounts of lumber and plywood.

International demand for many U.S. timber products, which had been slowly rising since economic conditions in our major overseas markets began to improve in 1975, continued up in early 1979. Current estimates are for continued slowly rising markets for the remainder of 1979 in most European countries with a continuation of this trend probable in 1980. The Japanese economy, including housing construction, which was moving at a relatively rapid rate in the first half 1979 is expected to slow somewhat in the second half and in 1980.

SOFT LUMBER

In response to the decline in the housing market and a continued high level of imports, softwood lumber production in the first 7 months of 1979 was below years-earlier levels. For example, data published by the National Forest Products Association show that output through July was about 3.5 percent below production in the similar period in 1978. Current expectations about housing and other markets in the final quarter of 1979 indicate that production will likely continue to drop and should total about 29.3 billion board feet for the year, about 5 percent under the 30.7 billion board feet produced in 1978 [table 1].

Data from the first 7 months of the year indicate that softwood lumber imports are likely to decline to about 11.3 billion board feet in 1979, 5 percent below previous record level of 11.9 billion imported in 1978. As has been true in recent years, nearly all of this will come from Canada. In response to increased demand, particularly from Japan, exports rose sharply in the first half, and are expected to total about 1.7 billion board feet, in 1979 one-fifth above the volume exported in 1978.

Based on the estimates of production, imports, and exports discussed above, apparent consumption—that is, production plus imports minus exports—in 1979 is estimated at 38.9 billion board feet—about 6 percent below 1978. Much of this decline is attributable to decreased use in residential construction. If housing construction drops as outlined above, and the other major markets perform as discussed earlier, consumption is likely to also decline in 1980. Production and imports are also expected to drop. Exports should show little change.

Softwood lumber prices, which showed little change during the late spring and early summer, have recently increased. In September, the producer price index for all softwood lumber was 405.6 [1967=100] [table 2]. This was about 14 percent higher than the index in January and about 17 percent above the average for 1978. Some slowing in the prices for many items is likely if demand drops in the months ahead as outlined above.

TABLE 1.—WOOD PRODUCTS PRODUCTION, CONSUMPTION AND TRADE (1976, 1977, AND 1978 ACTUAL, 1979 AND 1980 PROJECTIONS)

Product and year	Domestic production	Imports	Exports	Apparent consumption
Softwood lumber (billion board feet):				
1976.....	29.9	8.0	1.6	36.2
1977.....	31.2	10.4	1.4	40.2
1978.....	30.7	11.9	1.4	41.2
1979.....	29.3	11.3	1.7	38.9
1980.....	27.7	10.8	1.7	36.8
Hardwood lumber (billion board feet):				
1976.....	6.4	.3	.2	6.5
1977.....	6.6	.3	.3	6.7
1978.....	7.4	.4	.4	7.4
1979.....	8.1	.4	.3	8.2
1980.....	7.7	.3	.3	7.7
Softwood plywood (billion square feet, $\frac{3}{8}$ -in basis):				
1976.....	17.9	(1)	.7	17.2
1977.....	18.8	(1)	.3	18.5
1978.....	19.0	.1	.3	18.7
1979.....	19.0	(1)	.4	18.6
1980.....	18.2	(1)	.3	17.9
Hardwood plywood (billion square feet, $\frac{3}{8}$ -in basis):				
1976.....	1.3	2.4	.1	3.6
1977.....	1.4	2.3	.1	3.6
1978.....	1.6	2.5	(1)	4.1
1979.....	1.7	2.3	(1)	3.9
1980.....	1.6	2.1	(1)	3.6
Particleboard ² (billion square feet, $\frac{3}{4}$ -in basis):				
1976.....	3.2	.1	.1	3.2
1977.....	3.6	.1	.1	3.6
1978.....	4.4	.2	.1	4.5
1979.....	4.7	.2	.1	4.8
1980.....	4.8	.2	.1	4.9
Hardboard (million tons):				
1976.....	2.1	.2	.1	2.2
1977.....	2.2	.2	.1	2.4
1978.....	2.1	.3	(3)	2.4
1979.....	2.0	.3	(3)	2.3
1980.....	2.0	.3	(3)	2.3
Insulation board (million tons):				
1976.....	1.4	(3)	(3)	1.4
1977.....	1.4	(3)	(3)	1.4
1978.....	1.4	(3)	(3)	1.4
1979.....	1.4	(3)	(3)	1.4
1980.....	1.3	(3)	(3)	1.3
Pulpwood (million cords):				
1976.....	77.1	1.0	3.0	75.2
1977.....	79.5	1.2	3.1	77.6
1978.....	80.6	1.6	2.8	79.3
1979.....	83.6	1.1	3.3	81.4
1980.....	84.4	1.1	3.4	82.1

¹ Less than 50,000,000.

² Includes medium density fiberboard.

³ Less than 50,000.

Note: The projections presented for 1979 and 1980 are based on the trends in the major markets discussed in this paper and should not be viewed as forecasts of actual volumes. Data presented are subject to rounding.

TABLE 2.—PRODUCER PRICE INDEXES FOR SELECTED WOOD PRODUCTS

[1967=100]

Product	1977 annual	1978 annual	September	
			1978	1979
Softwood lumber.....	297.4	346.0	355.6	405.6
Hardwood lumber.....	200.3	235.8	245.2	260.7
Softwood plywood.....	295.8	326.4	327.8	331.0
Hardwood plywood.....	127.7	140.2	142.9	173.8
Particleboard ¹	113.5	151.2	155.1	138.0
Hardboard ²	142.7	157.0	158.8	170.8
Insulation board.....	177.9	202.5	208.6	187.3

¹ Corestock.² Type 11, 1/4-in.

Source: U.S. Department Labor, Bureau of Labor Statistics.

HARDWOOD LUMBER

Although there have been month-to-month fluctuations, production of hardwood lumber has been trending up during 1979 in response to rising demand in its major markets. National Forest Products Association data indicate that output through the first 7 months of the year was 11 percent above the January-July period in 1978. A continuation of this trend is likely as furniture and the other industrial markets continue to improve. Production is, therefore, expected to total 8.1 billion board feet for all of 1979, 9 percent more than in 1978.

In contrast to softwoods, hardwood lumber imports grew about 10 percent during the first half of 1979, however, the volumes involved were much smaller. As a result of that factor and a probable slowing in the last half, the total for this year is estimated at 0.4 billion board feet, about the same as in 1978. First half data also show exports below year-earlier levels. However, the volume is also relatively small and is expected to be 0.3 billion board feet, slightly under shipments in 1978.

Apparent consumption of hardwood lumber in 1979, based on the estimates of production and trade given above, should amount to about 8.2 billion board feet, 11 percent above 1978. If the hardwood lumber markets behave as discussed earlier, some decline in demand is probable in 1980.

Hardwood lumber prices, as measured by the producer price index, have also been increasing in 1979, though not nearly as rapidly as those for softwoods. Prices in September [index value 260.7, 1967=100] were only 2 percent above those in January.

SOFTWOOD PLYWOOD

According to data published by the American Plywood Association, total production of softwood plywood in the first 7 months of 1979 was 11.6 billion square feet [3/8-inch basis]. This is very near production in the comparable period in 1978. Based on the likelihood of continued current trends in the major markets in the last months of the year, softwood plywood production for 1979 is estimated at 19 billion square feet, about the same as in 1978.

Softwood plywood exports, which have been slowly rising in the early 1970's, continued up in 1979 and are expected to total about 0.4

billion square feet, about one-third above the volume in 1978. Imports will remain relatively insignificant.

Apparent consumption in 1979 is therefore estimated at 18.6 billion square feet, just slightly below 1978. The decline in 1979 is primarily due to rising consumption in maintenance and improvements, nonresidential construction, and in several important manufacturing uses which largely offset declines in residential use. Some further drop is likely in 1980. The producer price index indicates that softwood plywood prices have fluctuated somewhat in 1979 but in contrast to softwood lumber are under those early in the year. For example, the index for September was 331.0 [1967=100], 5 percent below January 1979 and only 1 percent above the average for 1978. Some decline is possible if demand slows in the weeks ahead and in 1980, as discussed above.

HARDWOOD PLYWOOD

Hardwood plywood production has been rising since 1975, and in response to the increases in the production of furniture and other manufactured goods, production in 1979 is expected to total about 1.7 billion square feet [$\frac{3}{8}$ -inch basis], some 6 percent above 1978.

Data for the first half indicate that imports are likely to total about 2.3 billion square feet, in 1979 down some 8 percent from 1978. Exports are expected to remain relatively insignificant.

Given these trends in production and trade, apparent consumption of hardwood plywood in 1979 is estimated at 3.9 billion square feet, down 5 percent from 1978. Some decline in consumption is probable in 1980 if the various hardwood markets continue the trends discussed earlier. As in most recent years, about three-fifths of total consumption will likely be supplied from imports.

In contrast to softwood plywood, hardwood plywood prices have exhibited an increase in the first 9 months of this year. In September the producer price index was 173.8, about 12 percent above the average in January. The relative wholesale price index for hardwood plywood [a measure of its price relative to all whole sale commodities] was 71.9 [1967=100], very near relative prices during most of 1974. Some leveling in prices can be expected in 1980 if the major markets continue as expected.

PARTICLEBOARD

Particleboard production (including medium density fiberboard) in 1979 is expected to be up about 7 percent to 4.7 billion square feet ($\frac{3}{4}$ -inch basis). Data for the first half of the year suggest that imports are likely to remain at about 0.2 billion square feet and that exports will be about half as large. Consumption is thus estimated at 4.8 billion square feet, also 7 percent above 1978. These increases are somewhat smaller than in 1978 and are primarily a reflection of the situation in housing—the market for large volumes of particleboard used for underlayment under carpeting and for subflooring in mobile homes. The expected drop in housing construction in 1980 should cause some decline in that end-use sector. However, continued growth in other sectors should offset the loss and production and consumption is likely to show a small increase.

HARDBOARD AND INSULATION BOARD

Hardboard production in 1979 is estimated at about 2.0 million tons (about 5.8 billion square feet, $\frac{1}{8}$ -inch basis), 5 percent below production in 1978. Imports are expected to total 0.3 billion ton about the same as the 1978 volume. Exports will likely remain small. Consumption with these estimates of production and trade would amount to 2.3 million tons (approximately 6.5 billion square feet), down about 4 percent.

Data for the first half of 1979 indicate that insulation board production for the year will total about 1.4 million tons (3.3 billion square feet, $\frac{1}{2}$ -inch basis) the same as in 1978. Imports and exports are expected to be under 0.1 million ton. Therefore, consumption is also estimated at 1.4 million tons, also the same as last year and in 1977.

If housing and manufacturing output follow the trends outlined earlier, the demand for hardboard and insulation board will probably show some decline in 1980.

PULPWOOD

According to data from the American Paper Institute, production of paper and paperboard in the first 8 months of 1979 was at an annual rate of about 64.5 million tons, 4.5 percent above production in 1978, and also somewhat above the historic high reached in 1973. As a consequence, production of woodpulp—which currently constitutes about 77 percent of the raw materials consumed in U.S. paper and board mills—also rose to record levels, as did the pulpwood used for its production. Industry data indicate that paper and board production, and consequently woodpulp and pulpwood production, are likely to continue at relatively high levels for the remainder of the year. Based on these factors, pulpwood production (roundwood and chips) for 1979 is estimated at 83.6 million cords, 4 percent above 1978 and a new record volume about 2 percent above the previous high reached in 1974.

Imports of pulpwood are expected to total about 1.1 million cords and exports approximately 3.3 million. These volumes are, respectively, about 30 percent below and 18 percent above 1978. The sharp decline in imports reflects a large drop in both chip and roundwood from Canada, our principal source of pulpwood imports.

Pulpwood consumption in 1979, given the above estimates of production and trade, amounts to 81.4 million cords, almost 3 percent more than in 1978. Prospective trends in economic activity and in manufacturing suggest that rising trends in pulpwood production and consumption, will possibly continue in 1980 but at a somewhat slower rate than in the past year.

SOFTWOOD LOGS

Softwood log exports through the first 7 months of 1979 amounted to about 2.3 billion board feet, the bulk of these shipments moving from the Pacific Coast States of Washington and Oregon to Japan.

Reports from Japan indicate that exports to that country may remain relatively high in the remaining months of 1979. Exports for the year have, therefore, been estimated at about 3.8 billion board feet, 15 percent above shipments in 1978 and a new record level. Exports in 1980 should remain at about the same volume. Imports of softwood logs have decreased somewhat and are expected to total 0.1 billion board feet in 1979, the same as in 1978.

HARDWOOD LOGS

Hardwood log exports in 1979 are estimated at a little over 0.1 billion board feet, about the same as in 1978. Although the volume is relatively small, many of the logs are walnut, high quality oak, and other preferred species that are in short supply in the United States. Thus, exports have been an important contributing factor to the large increases in stumpage and log prices for these species. Hardwood log imports have been dropping rather steadily since the mid-1950's and are expected to total only 10 to 15 million board feet in 1979. There will probably be little change in imports or exports in 1980.

SUMMARY

Given the trends in consumption, trade, and production for the various products discussed earlier, U.S. production of all roundwood products, including an estimated increase in fuelwood output, is expected to rise to about 12.6 billion cubic feet in 1979. At this level, output would be slightly above 1978 and a new record volume.

Total imports, including the pulpwood equivalent of pulp, paper, and board, are likely to drop to about 3.6 billion cubic feet, 2 percent below 1978. Exports, on the other hand, are expected to rise about 13 percent largely due to pulp, paper, and log exports.

With these volumes of production and trade, total apparent consumption of industrial roundwood will be 14.5 billion cubic feet, somewhat under consumption in 1978. Some decline in consumption, imports, and production can be expected in 1980 if the various markets, particularly housing, behave as discussed earlier. Exports will likely show relatively little change or perhaps a slight rise.

FARM OUTLOOK



FARM INCOME AND FINANCIAL CONDITIONS

(By George Hoffman, Economics, Statistics, and Cooperatives Service,
U.S. Department of Agriculture)

The situation and outlook for the U.S. economy, agricultural trade, and the individual commodities is being presented at other sessions of this outlook conference. Later this afternoon we will hear more about recent trends in credit and the 1980 outlook concerning farmers' costs and expenditures for production items. This session brings all this information together in such a way to provide some insight to the overall financial condition and well-being of the agricultural sector.

USDA has developed several national aggregate measures which are helpful in assessing the economic condition of farmers. These include measures of net farm income, the net worth and debt positions of farmers and off-farm income. The following discussion will first review the traditional national farm income accounts for 1979 and trends expected for 1980. This will be followed by an assessment of the financial position of farmers in terms of net worth, debt, and other measures of well-being. Finally we will look at some of the shortcomings of national aggregate measures and discuss some initiatives underway in USDA to develop some alternative measures of the well-being of the farm sector.

1979 FARM INCOME

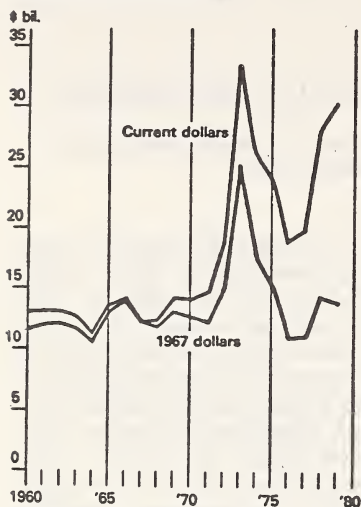
Net farm income in 1979 is expected to total \$30 to \$32 billion, the second largest in history, and a gain of more than 10 percent from 1978 (table 1). Although total production expenses will jump about 16 percent this year, to a total of around \$114 billion, cash receipts from crop and livestock marketings will total a record high \$129 billion, also a gain of 16 percent from 1978.

TABLE 1.—FARM INCOME, 1976-79
(In billions of dollars)

	1976	1977	1978	¹ 1979
Cash receipts:				
Crops	48.7	48.2	52.1	62.0
Livestock	46.1	47.4	59.0	67.0
Total	94.8	95.6	111.1	129.0
Value of inventory change	-2.4	1.1	1.1	3.0
Direct government payments .....	.7	1.8	3.0	1.0
Nonmoney and other income	8.7	10.0	10.8	12.0
Gross farm income	101.8	108.5	126.0	145.0
Production expenses	83.1	88.8	98.1	114.0
Net farm income:				
Current dollars	18.7	19.8	27.9	31.0
1967 dollars	11.0	10.9	14.3	14.3

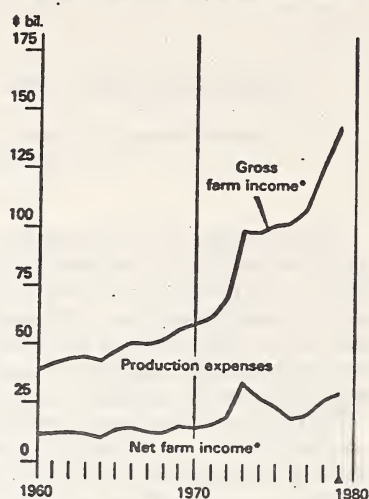
¹ Forecast.

Net Farm Income Improves



1979 forecast. CPI all items used as deflator.

Farmers Gross More, Expenses Rise Less



*Includes change in farm inventories. ▲ Forecast.

The relatively favorable net farm income picture for 1979 primarily stems from sharply higher livestock prices in the first half of the year and a record large 1979 grain crop, with grain prices supported by a strong grain export demand.

Cash receipts up

Prices received by farmers for livestock and livestock products jumped 19 percent in just 5 months between November 1978 and March 1979. First quarter 1979 prices averaged more than one-third higher than the year before. Livestock price increases were boosted by record high cattle prices in the spring as cattle slaughter dropped almost 20 percent below a year earlier, reflecting the result of 4 years of cattle herd liquidation. Hog prices also rose with the cattle market early in 1979 before pork supplies began to significantly increase in the second quarter. Higher milk and egg prices and production in 1979 will boost cash receipts for these products 10 percent or more above 1978. Broiler price declines late in 1979, under pressure of large pork and broiler supplies, will limit gains in their 1979 cash receipts to less than 10 percent.

Although livestock prices dropped about 13 percent between March peaks and August lows, prices during the first three quarters of 1979 averaged 23 percent higher than a year earlier. For the year, livestock prices likely will average nearly one-fifth higher than in 1978. The 1979 gain in livestock prices will more than offset an overall decline in livestock marketings (the decline in cattle marketings more than offsets the increase in hogs). This will raise cash receipts from livestock and livestock products to a record \$67 billion in 1979, a gain of 14 percent from 1978. This represents a gain of over 60 percent from the depressed livestock situation of 1974. With the exception of hogs,

cash receipts for all classes of livestock products will be up in 1979. Hog receipts will remain near or slightly below the 1978 level.

Cash receipts from crops are also up this year as larger crops are being marketed at higher prices. Although 1979-80 feed grain production is up 3 percent from last year's record, to 224 million metric tons, prices are holding up because of heavy feed demand, especially for broilers and hogs, and a growing export demand. Even with a record U.S. corn crop of 7.4 billion bushels, corn prices are expected to remain above 1 year ago through the harvest season.

Strong foreign demand for wheat and soybeans have also held their prices up this year, even in the face of significant increases in U.S. production. Wheat prices have been bolstered by increases in wheat exports in response to reduced production around the world, including the U.S.S.R., Canada, Australia, and East, and West Europe. Although soybean prices are currently below 1 year ago, price declines have been moderated by an increase in the soybean crush for increased hog and broiler feeding. Strong export demand for rice and cotton boosted their prices in mid-1979 despite prospects for increases in the 1979 rice and cotton crop.

Prices received by farmers for all crops in 1979 likely will average about 9 percent higher than in 1978. Coupled with increases in crop marketings, cash receipts for crops are expected to total around \$62 billion, a gain of 19 percent from last year and almost 29 percent from 2 years ago.

Government payments down

Improved grain prices and generally favorable weather this year will result in a reduction of direct Government payments to farmers by almost \$2 billion from 1978. Payments during the first three quarters of the year totaled less than \$1 billion compared with \$1½ billion for the same period in 1978.

Nonmoney and other income

The nonmoney and other income category of the farm income accounts includes cash income from such sources as recreation, machine hire, and custom work, the rental value of housing provided by farm dwellings, and the value of farm products consumed directly in farm households. Including nonmoney imputations to farm income is consistent with procedures used by the Department of Commerce in the National Income Accounts to allow comparison of personal incomes of farm and nonfarm populations.

Nonmoney and other income is estimated to total about \$12 billion in 1979, 11 percent above 1978. It should be noted that nonmoney imputations do not add on a dollar-for-dollar basis to net farm income since expenses for these items are also included in production expenses.

Production expenses jump

Farmer's production expenses likely will total nearly \$114 billion in 1979, a gain of 16 percent from 1978. Most of the increase is due to higher prices. The big gainers this year are feed and livestock purchases, fuel, and interest expenditures. Livestock expenditures, fueled by feeder cattle price increases, may be up more than one-fifth this year as higher prices more than offset the decline in the number of heads purchased. Increased feed use at higher prices has contributed

to an expected increase of over 15 percent in feed expenditures. Expenditures for farm-origin inputs (purchased livestock, feed, and seed) are about 28 percent of total production expenses this year—about the same proportion as in other recent years.

There are important differences between farm-originated inputs and nonfarm inputs. Expenditures for farm-originated inputs represent income to other farmers. Also, these prices sometimes fall as well as rise.

Fuel expenditures will be the production expense item showing the largest increase in 1979, perhaps gaining 40 percent or more from 1978. Although fuel still only accounts for about 6 percent of total production costs this is double the 3-percent share of 1972.

Higher interest rates are also boosting production expenses sharply this year. The interest expense on real estate and short term debt will be up about one-fourth from 1978 and account for nearly 10 percent of total expenses. Ten years ago these interest expenses were only 7 percent of total production expenditures.

Some of the major production expenses which are expected to increase at less than the average rate of 16 percent in 1979 include seed, fertilizer, repairs, hired labor, pesticide, and taxes.

Net farm income second highest

If gross receipt and production expenses develop as outlined above, net farm income in 1979 will total close to \$31 billion, a gain of about \$3 billion from 1 year ago. This level, however, still falls about \$2 billion short of the previous record level set in 1973. Farmers have marketed more products and farm commodity prices are higher in 1979 than in 1973 but production expenses have increased even more than income. Prices received by farmers in 1979 will average about one-third higher than in 1973, and larger crop and livestock production will boost cash receipts this year almost one-half again as large as in 1973. Total production expenses, however, have risen by over 70 percent, from about \$66 billion in 1973 to an estimated \$114 billion this year.

This year's increase in net farm income will about keep pace with the general rate of inflation. By converting this year's \$31 billion into 1967 purchasing power, real net farm income totals about \$14.3 billion, the same as 1978, and well above 1976 and 1977 levels.

1980 INCOME OUTLOOK

The 1980 farm income outlook is mixed and there are some areas of concern. Crop and livestock prices are expected to at least maintain 1979 record high levels through 1980 and total cash receipts likely will rise to new record highs. However, the outlook is for substantially increased production expenses which will more than offset income gains, reducing net farm income.

The 1980 outlook for cash receipts is based on current forecasts of supply and price conditions expected for the individual commodities in the upcoming year:

The 1979 wheat crop was up 18 percent, the third largest on record. Production shortfalls around the world, however, could boost wheat exports to near record levels and season average prices likely will be higher than 1978-79.

Feed grain prices in the 1979-80 marketing year likely will average higher than last season even though 1979 production is record large. Export demand is strong and feed use is expected to rise to near previous record levels of 1972-73.

The soybean crop will be up 18 percent this year. Both exports and the crush will be up but not as much as the supply. Soybean prices are expected to average lower next year.

The record large 1979 rice crop is being met by increases in food use and another strong year for brewery use. Prices are expected to rise.

Cotton production is up almost one-third. Although exports are expected to be the highest in 20 years, domestic mill use is expected to decline and carryover stocks will rise.

Bountiful supplies of both fresh and processed vegetables will dampen price rises for those items this fall and winter. Grower prices are expected to remain below 1978-79.

The 1979-80 citrus crop is expected to be record large, up 15 percent from last year. This will put downward pressure on grower prices next year, especially for oranges.

The 1979 tobacco crop is down about 17 percent from last year, the smallest crop in over 20 years. Price increases probably will not offset production declines.

Beef production may hold about steady in 1980 now that herd liquidation is largely completed. Prices will remain high but increases will be limited by large pork supplies.

Pork production is expected to continue near record levels through the first half of 1980. Hog prices will be down substantially from 1979 and will be below the cost of production for many producers.

Chicken and turkey production is expected to remain above year-earlier levels during the first quarter of 1980 then decline for the balance of the year. Record pork production, however, is expected to hold broiler prices below 1979 levels.

Egg production may be slightly higher in early 1980 but large supplies of other protein foods may hold egg prices below early 1979 levels.

Milk production in 1980 is expected to exceed 1979 by about 1 percent and prices may rise by 10 percent.

When summarizing all these price and quantity changes expected for the 1980 calendar year, total cash receipts may grow another 2 to 3 percent from 1979. This assumes no major weather-related disruptions or shortfalls in the 1980 crop, in the United States or abroad. Almost all the increase in cash receipts is on the crop side as crop prices average higher than in 1979. Increases in cash receipts for feed grains (except barley) and wheat offset declines for soybeans. Current indications are that crop receipts could be up \$2 to \$3 billion from 1979. For livestock, cash receipts may not change much from 1979 levels. Some gain in receipts from dairy products and cattle and calves likely will be offset by expected declines for hogs and poultry. Considering only slight increases in Government payments and a modest increase in other income, gross farm income would therefore only grow another 2 to 3 percent from the 1979 record level.

Although gross income could continue to increase next year, total production expenses are likely to increase at least as much as the increase in the overall prices paid index. Like in 1979, fuel expenses will continue to be a big increase item in 1980, perhaps gaining by another third or more. Expenditures for fertilizer, especially anhydrous and urea, and higher interest costs will be major factors raising total production costs. Gains in farm-origin input costs (primarily feed and feed livestock) probably will be much less in 1980 than in 1979. As in 1979, only modest increases in expenditures for pesticides, seed, and hired labor are expected. More detailed information on the 1980 outlook for the individual inputs will be presented later this afternoon.

If total production expenses rise at about the general rate of inflation in 1980, as now seems likely, gains in gross income will be more than offset and net farm income would decline from this year, totaling around the mid-\$20-billion level. This is down substantially from 1978 as well as 1979 but is still higher than 1976 or 1977. It should be noted at this point that net farm income is extremely sensitive to small changes in average prices. For example, at current levels a 1-percent increase in prices received by farmers translates directly to a \$1.3 billion increase in cash receipts and net income.

Factors underlying farm income are fairly well established through early 1980 but much uncertainty still remains for the last half of the year. By midyear grain prices will begin to be influenced by new crop prospects and livestock producers will respond accordingly. Although the current harvest is now largely completed there is still considerable possibility for variation which would affect 1980 prices and cash receipts. The size of Southern Hemisphere crops, particularly soybeans, will affect prices early in 1980. By next spring and summer the new wheat crop and expectations for the fall harvest will begin to influence prices. Also, prices for many crops depend critically on export demand which could vary depending on weather conditions and the severity of recession abroad.

The difficulty with making detailed commodity forecasts is when and how to introduce developments which can disrupt longrun supply/demand relationships. The probability of any one major event is quite small, yet, from an overall viewpoint such disruptions are common. Many of these disruptions would result in higher returns to farmers than would be expected with the assumption of normal weather and high crop yields. Weather problems in the United States or another crop shortfall in other countries next year could boost domestic grain prices. The forecasts for 1980 crops are based on the assumption of average weather during the growing season. Smaller-than-average crops would cause higher prices which, together with disaster payments, would possibly increase cash receipts. On the other hand, with very high yields, price support and reserve programs for major crops will prevent a major decline in cash receipts for crops. Also, if pork producers react quickly to poor returns, production increases could be moderated in the second half of the year and hog and broiler prices could average higher than now seems likely. When all these factors are taken into account it appears that the possibilities are greater for circumstances which would rise cash receipts than for events which would make them lower than current forecasts.

The extent to which rising prices of farm inputs will reduce net farm income depends to a large degree on how much farmers are able to adjust the quantities of inputs in response to higher input prices. For example, producers may not have much flexibility in adjusting total expenditures on such items as interest on real estate debt, seed, pesticides, and repairs, but total quantities of feed, livestock, and fertilizer could be significantly adjusted in response to higher prices. Although many production expenditures are committed early in the season, producers may also cut back on some inputs as the crop year progresses if it is apparent by midyear that gross incomes are not keeping up with expenses. These adjustments could moderate the increase in production expenditures next year and thus support net farm income.

ASSET/DEBT POSITION OF FARMERS

Farm income is but one indicator designed to measure the well-being of the farm sector. The farm income accounts focus primarily on annual income flows from farm operations. Equally as important is the overall financial position of farmers as reflected by their assets, debts and equities which provide a longer run perspective. In recent years capital gains have far outdistanced farm income as an element adding to the real wealth of farmers.

Since 1970 the value of farm assets has tripled and on January 1, 1980 the total value of assets in the farming sector is expected to reach almost \$950 billion, a gain of 16 percent from the year before. Farm real estate makes up almost three-fourths of this total. The 16-percent rise in farmland values this year was the primary factor boosting total assets but the 25-percent rise in the value of livestock inventories (primarily cattle) has been a contributing factor.

With the increase in total assets in recent years there has been a clear trend toward a larger proportion of assets with low liquidity. At the beginning of this year 83 percent of total assets were in real estate and machinery. Thirty years ago two-thirds of total assets were real estate and machinery.

Farm debt outstanding on January 1, 1980 is expected to be up about 15 percent from the year before, offsetting some of the increase in assets. Real estate debt accounts for over one-half of the total. The rate of increase in total debt this year has been about the same as in 1977 and 1978. Although up from 1974-76 levels, the debt to asset ratio at the beginning of 1980 likely will not be much different than the 161/2 percent levels of the previous 2 years.

Capital gains in agriculture are an important part of the additions to total wealth of the farm sector even though these gains are not spendable income in the year earned. In 1978, capital gains on farm assets are estimated to have been about \$91 billion, over three times the level of that year's net farm income. About 70 percent of that gain was in real estate. Capital gains in 1979 could be up 20 to 25 percent from 1978. Capital gains on farm physical assets have consistently exceeded annual net farm income each year since 1970. Although an adequate flow of current earnings is necessary, the farm sector's strong equity position allows it to overcome some annual income fluctuations as long as depressed earnings are not prolonged.

THE PROBLEM WITH AGGREGATE MEASURES

National aggregate measures are useful indicators of the economic well-being of farmers in general but these aggregate measures are certainly not an indication of the financial status of every farm operator. Net farm income varies according to regions, commodities produced, debt positions, farm size, distance from the market and local weather. Also individual circumstances differ considerably because farm families do not equally share in off-farm income.

Declines in net farm income expected in 1980 will not be equally shared by all farmers. Pork producers incomes will be substantially reduced next year and returns to cattle feeders and broiler producers may be tight at best. Prices for soybean producers will be down and growers of citrus and vegetables face potential prices declines. The 1980 outlook for feed grain, wheat, dairymen, and feeder cattle producers, however, looks favorable.

Even considering supply and price prospects for the various commodities, the current financial condition of individual farmers will be an important factor in terms of their ability to endure annual income fluctuations. Individual farmers with recently purchased farmland will tend to have a higher debt/asset ratio. Asset appreciation is not spendable income and annual interest payments must be met. However, even wheat and feed grain farmers with a high debt/equity ratio would be in a relatively better position in 1980 than would hog or broiler producers, especially those who have expanded operations in recent years and have no alternative source of income.

Aggregate measures also mask substantial differences among farmers according to size of operations. Capital gains are an important source of wealth in the farm sector but assets are not equally distributed. In 1978, about one-third of total farm assets were controlled by 6 percent of the farms which had gross sales of \$100,000 and over. Over one-third of all farms have sales of less than \$2,500 annually but these farms only control about 12 percent of total assets. On the other hand larger farm operations have higher debt/asset ratios. The debt/asset ratio for small farms in 1978 was about 5 percent compared with 23 percent for farms with sales of \$40,000 to \$100,000. Thus large operations could have cash flow problems in the shortrun, with a decline in net farm income but would be financially secure in the longrun. On the other hand, small producers with a low debt/equity ratio may not be as severely affected in the shortrun but would fall behind over time, in terms of total financial gains.

One factor that has aided the cash flow situation for many farmers is nonfarm employment of family members. For all farm-operator families as a group, off-farm income has exceeded net farm income in 10 of the last 12 years.

As the farm population has decreased, an increasing proportion of the remaining farmers have been shifting from farm to nonfarm employment. Off-farm earnings are particularly important to farm operator families whose gross sales of farm commodities are below \$20,000. On average, these families earn most of their income from off-farm employment. Off-farm income ranges from 91 percent of total income for farm operators with total sales of less than \$2,500 to only 17 percent

for farmers with operations grossing over \$100,000 per year. Again, operators of larger farm units are in a position where even small changes in prices received for farm products, or prices paid for expenses, can cause substantial variation in family earnings.

NEW INITIATIVES IN MEASURING ECONOMIC CONDITIONS IN THE FARM SECTOR

During the upcoming year, exchanges are planned in the farm income project that develops and reports measures of the well-being of the farm sector. The objective of these changes is to provide a set of measures that more adequately reflect the relative position of farmers considering the tremendous diversity of the farm sector. This diversity in farm production has resulted from structural adjustments in agriculture over time. Farms have been transformed from relatively self-contained units supplying most of their own inputs, and producing a variety of products, to present day operations which must increasingly rely on the marketplace for inputs. Many production units are becoming more product-specialized, often including some degree of processing.

To facilitate the representation of these diverse subgroups of producers a new system of reporting the farm sector's well-being is currently being tested. When complete, the new system will trace farm receipts, expenses, net income, wealth, and asset positions of individual subgroups of producers. These subgroups will be divided according to such factors as major commodity, geographic locations, and size. New data will also eventually be used to trace farm income to individuals controlling the inputs and management of the production unit. This will allow comparisons of income levels for farm operators, resource owners, and laborers.

Some of the specific indicators being developed to measure the economic viability of the farm sector include receipts, expenses, nonproduction income, value added, asset value, asset appreciation, resource returns, equity position, cash flows, and total wealth generated, which includes capital gains and current income. By using such a family of indicators the relative gains and losses of particular producer subgroups can be determined in a manner which will be more meaningful than the traditional aggregate measures. Hopefully, we will be able to discuss some of these new measures in more detail at next year's outlook conference.

244 AGRICULTURAL FINANCE OUTLOOK []

(By Dean W. Hughes, ESCS, NED, U.S. Department of Agriculture)

THE BALANCE SHEET FOR JANUARY 1, 1980 AND 1981

This year, as in the past, the current year's balance sheet has been compiled using a consensus of information from many sources. However, in keeping with the world view of this conference a new model is being used by our section for forecasts into the future. The old aggregate income and wealth simulator introduced several years ago has been replaced by a new model named GEM, short for general equilibrium model of agriculture as part of the U.S. national economy. Time is too short to discuss the properties of this new model today but will be documented in a technical report early next year.

The largest item in the balance sheet of agriculture is real estate. We believe the value of these assets will increase on average 16 percent this year based on the consensus of forecasts by surveyed lenders from commercial banks, the farm credit system, life insurance companies, Farmers Home Administration, the Extension Service, and others. The rate of increase for 1980, however, is projected to be sub-

FIGURE 1.—BALANCE SHEET OF THE FARMING SECTOR

[Dollar amounts in billions]

Items/years (Jan. 1)	1977	1978	1979	1980 ¹	1981 ²	Percent changes—	
						1979-80	1980-81
ASSETS							
Physical assets:							
Real estate.....	\$483.8	\$525.8	\$599.5	\$696.0	\$726.7	16	4
Nonreal estate:							
Livestock and poultry.....	29.1	32.0	51.3	64.0	56.8	25	-11
Machinery and motor vehicles.....	71.9	77.7	84.3	97.0	105.5	15	9
Crops stored on and off farms.....	22.0	24.9	27.4	30.5	34.3	11	12
Household equipment and furnishings.....	14.4	16.4	19.2	22.0	22.1	15	1
Financial assets:							
Deposits and currency.....	16.0	16.3	16.8	17.2	17.3	2	1
U.S. savings bonds and investments in cooperatives.....	18.6	19.9	21.7	23.3	26.4	7	13
Total assets.....	655.8	713.0	820.2	950.0	988.9	16	4
CLAIMS							
Liabilities:							
Real estate debt.....	56.6	63.7	72.3	83.1	95.6	15	15
Nonreal estate debt to:							
CCC.....	1.0	4.5	5.2	4.5	4.6	-13	2
Others.....	45.1	51.1	6.0	70.2	82.1	17	17
Total liabilities.....	102.7	119.3	137.5	157.8	182.4	15	16
Proprietors equities.....	553.1	593.7	682.7	792.2	778.5	16	-2
Total claims.....	655.8	713.0	820.2	951.0	988.9	16	4

¹ Preliminary.

² Forecast using GEM model.

stantially below those of the most recent past. Although this expected decline in growth is due mostly to forecast decreases in net farm income, higher interest rates will also play a minor role.

Not too many years ago many agricultural economists expressed concern over the levels of land prices and whether a dramatic decline might be expected. For example, in the AJAE of May 1978, Raup wrote "One interpretation of the current land market is that it exhibits many of the characteristics of an inflationary boom that is nearing its bursting point." However, as such dire predictions have yet to materialize, others, among them Melichar, one of the members of our panel, and Lins, an economist in the Inputs and Finance Branch of the USDA, have been looking more closely at the available data and they find that there are rational explanations for current land prices.

FIGURE 2.—CASH SOURCES AND USES OF FUNDS IN THE FARM SECTOR

[Dollar amounts in billions]

Items/years	1976	1977	1978	1979
CASH SOURCES OF FUNDS²				
1. Net cash income from farm and nonfarm sources.....	\$64.8	\$64.5	\$79.1	\$96.8
2. Net flow of real estate loans.....	4.9	6.3	7.7	9.6
3. Net flow of nonreal estate loans ³	5.7	6.0	8.9	10.2
4. Total cash sources of funds ⁴	75.4	76.8	95.7	116.6
CASH USES OF FUNDS				
5. Purchases of machinery and motor vehicles.....	7.3	9.8	12.3	15.5
6. Capital improvements to real estate assets.....	8.2	5.8	8.9	7.4
7. Other capital purchases ⁵	1.9	3.8	5.3	5.8
8. Annual capital formation.....	17.3	19.4	26.5	28.7
9. Purchases of real estate from discontinuing proprietors.....	10.9	11.5	12.7	12.8
10. Total purchased capital.....	28.2	30.9	39.2	41.5
11. Personal consumption and other cash uses.....	47.2	45.9	56.5	75.1
12. Total cash uses of funds.....	75.4	76.8	95.7	116.6
13. Total purchased capital.....	28.2	30.9	39.2	41.5
14. Change in inventories.....	-2.3	1.1	1.1	3.0
15. Total capital flow.....	25.9	32.0	40.3	44.5
REAL DOLLAR FLOWS				
16. Total net cash income/CPI.....	38.0	35.5	40.5	44.2
17. Personal consumption and other cash uses/CPI.....	27.7	25.3	28.9	34.3
ANALYTICAL RATIOS (PERCENT)				
18. Total purchased capital/total net cash income (line 10÷1).....	44	48	50	43
19. Total net flow of loans/total purchased capital (lines 2 and 3÷10).....	38	40	42	48
20. Total net flow of loans/total capital flow (lines 2 and 3÷15).....	41	38	41	44
21. Cash income/total cash uses (line 1÷12).....	86	84	83	85

¹ Preliminary.² Cash sources of funds from sale of real estate to the nonfarm sector are not included because of lack of data.³ Does not include CCC loans.⁴ Gross cash operating expenses have been deducted from gross cash farm income.⁵ Includes net additions to household furnishings, commercial bank deposits and currency, and purchases of breeding livestock.

Information on real returns to land and other production assets in agriculture shows that while they have been highly variable year to year, in the longer run these returns have shown continuing increases in the postwar period. As the growth in returns has been incorporated into expectations, rapidly increasing prices have been the result. To

forecast rapid decreases in the value of farm real estate, however, it would be necessary to either reverse the expectations of a 30-year trend or to have some sort of catastrophic trigger placing a large fraction of total land on the market at one time. Although we do expect a decrease in returns in 1980, a 1-year change is unlikely to influence buyers' expectations sufficiently to cause a decline in land values. And, given the number of Government programs designed specifically to help agriculture during disasters, large numbers of foreclosures of farms—if not impossible—are so unlikely as to not require discussion. So, even given our forecast of declining farm incomes next year, there are still reasons to expect increases in real estate values. Other assets on the balance sheet show some gains with the exception of the value of livestock inventories, which are expected to peak in 1979.

Debts of the sector are expected to increase this year by about as much as in recent years. And, next year we expect a greater increase due to the combination of continued relatively strong demand for machinery, higher production expenses and increasing land values coupled with lower income.

THE SOURCES AND USES OF FUNDS STATEMENT

The sources and uses of funds statement basically reemphasizes the points made when discussing the balance sheet. This year, 1979, will be an excellent year for farmers, with a record flow of funds using only about 15 percent debt financing as opposed to using about 17 percent debt in 1978. In 1980 though, over 21 percent of farmers' sources of funds are forecast to come from lenders, at higher interest rates.

Just as an aside let me point out that some minor changes have been made to this account since last year. The "Agricultural Finance Outlook" report provides restatements back to 1970 for those of you who use these numbers.

FIGURE 3.—*Inflationary budgets*

No inflation :

Gross receipts from marketings.....	\$100. 00
Production expenses before interest ¹	—50. 00
Interest expense (\$50) (0.05).....	—2. 50

Profits in constant dollars.....	47. 50
Margin on sales (47.50/100).....	. 475

10 percent change in all prices :

Gross receipts (\$100) (1.10).....	110. 00
Production expenses.....	—50. 00
Interest expense (\$50) (0.15).....	—7. 50

Profits in current dollars.....	52. 50
Margin on sales (52.50/110).....	. 475

Profits in constant dollars (52.50/1.10).....	47. 50
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10 percent change in CPI, 5 percent change in prices received by farmers :

Gross receipts (\$100) (1.05).....	105. 00
Production expenses.....	—50. 00
Interest expense (\$50) (0.15).....	—7. 50

Profits.....	47. 50
Margin on sales (47.50/105).....	. 452
Profits in constant dollars (47.50/110).....	43. 18

¹ Production inputs are assumed to be purchased on Jan. 1 while sales and debt repayments are made Dec. 31. Therefore, the inflation of the current year impacts only on receipts and debt expenses, not on other production items.

HIGH INTEREST RATES AND AGRICULTURE

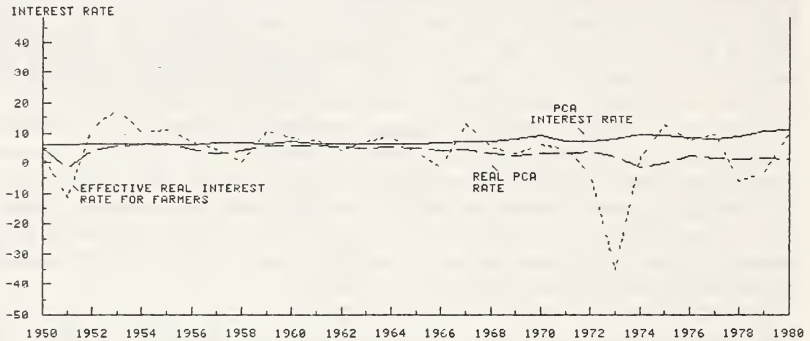
The tightening of the money supply instituted by the Federal Reserve during October to fight inflation has created a situation where farmers now face the highest nominal interest rates of this century. And, given the telephone calls we have received, I am sure that the implications of these policies on agriculture are of interest to many of you here today. Will there be a credit crunch causing drastic changes in the ability of farmers to produce next year? How will the interest rates impact on the costs of running farms? And, will there be longer run implications on the productive capacity of the sector?

Since we are dealing with a phenomena that is unprecedented during the lives of anyone here today, there is a need to put the facts in some sort of perspective. A prime interest rate of $14\frac{1}{2}$ percent does not mean that farm loans will necessarily cost that much. Changes in farm rates as measured by the interest rates charged by the Farm Credit System tend to lag behind changes in the prime rate due to the turnover of bonds that finance their lending activities. If, for example, the interest rates had a once-and-for-all increase of one percentage point today, and the longest maturing Farm Credit System bond issue was 10 years, the increase in interest rates paid by farmers would be spread out over the entire 10-year period. Of course, commercial banks, and insurance companies will react to changes in money market conditions more quickly, but competitive pressures should keep farm interest rates moving up and down more slowly than interest rates charged to other sectors of the economy.

To better understand today's economy, we must start dealing with real prices and interest rates instead of the nominal rates with which we are more familiar. If all prices are increasing at 10 percent per year, then it is unreasonable to be upset by an interest rate which is 13 or 14 percent. To show this is so, let's work through a simple budget model. (Of course, this is a hypothetical exercise and the numbers are only meant to illustrate a point.) First, assume that there is no inflation and a farmer borrows \$50 at 5-percent interest for the production inputs to grow products which he sells at the end of the year for \$100. His profit is then \$47.50 or $47\frac{1}{2}$ -percent margin on sales. If, however, inflation is occurring at 10 percent per year so that the interest rate is 15 percent, he would still buy the \$50 worth of inputs, but he would receive \$110 for selling his product at the end of the year. In this case, his profit would be $\$110 - \$50 - \$7.50 = \52.50 or $47\frac{1}{2}$ -percent margin on sales and he would have the same \$47.50 in purchasing power. Clearly then, higher interest rates caused simply by changes in prices neither help nor hurt the borrower. The solid line in figure 4 shows the nominal interest rate charged by PCA's and the broken line shows the "real" interest rate charged where the percent change in the CPI is subtracted from the nominal rate. Unfortunately, prices received by farmers do not always move up and down precisely as much as the prices of all other goods in the economy. During times when farm prices are lagging behind those in the rest of the economy, higher nominal interest rates reflecting overall price changes do reduce net farm income. Let's return to our simple budget again. If the overall inflation rate is still 10 percent but prices received by farmers

are rising by only 5 percent, then the profit of our hypothetical farmer is $\$105 - \$50 - \$7.50 = \47.50 , identical to the no inflation scenario, but in this case, only a 45.2-percent margin on sales and a purchasing power of only $\$43.18$ in constant prices. The broken line in figure 4 presents the PCA real interest rate if the percentage change in the index of prices received by farmers is used instead of the CPI. The most interesting thing to note is that the Federal Reserve's current tight money policy is coming just at the time we are forecasting farm price increases lower than the increases in the overall price level so the effective real interest rate to farmers will be higher than for other sectors of the economy.

FIGURE 4. NOMINAL, REAL AND EFFECTIVE REAL INTEREST RATES FOR PRODUCTION LOANS



However, farmers have faced high short term effective real rates of interest in the past and have shown themselves to be insensitive to such levels. It is not difficult to understand why this is so if one looks at the size of interest payments relative to other expenses that farmers face annually and the effect that current changes in the interest rate have on expenditures. Even with the growth of debt financing over the last 20 years, total interest payments have been less than 10 percent of total production expenses in recent years. So an increase in interest changes of 10 percent would only increase total production by 1 percent. And, even if we assure a complete passthrough of interest rate increases on short-term loans and new longer term mortgages, an increase in the current interest rate of 10 percent would only increase the interest bill by about 6 percent and production expenses by 0.6 percent. When tax implications are taken into account the impact is even less. If we assume a 50-percent tax bracket the 10-percent increase in interest rates would decrease net income by only 0.3 percent. Couple this with the fact that there is a long lag in current interest rate changes impacting on interest rates charged by the Farm Credit System and rural banks, it is unlikely that farmers will change the amount of debt that they desire by much in light of even the big jumps in interest rates that we have seen recently.

As can be seen in figure 4, farmers have had effective real loan rates in excess of what is predicted for next year in 7 years since 1950. In the early fifties, they went through a period where they faced over 10-percent rates for 4 years in a row. Other years with high interest

rates included 1959, 1967, and 1975. In all of these years, except 1953, non-real-estate debt excluding CCC loans increased in nominal terms and, out of the total of 7 years, 5 had increases in the real stock of short-term debt. We, therefore, do not expect higher interest rates, be they nominal or real, to have much effect on farmers' demand for loans.

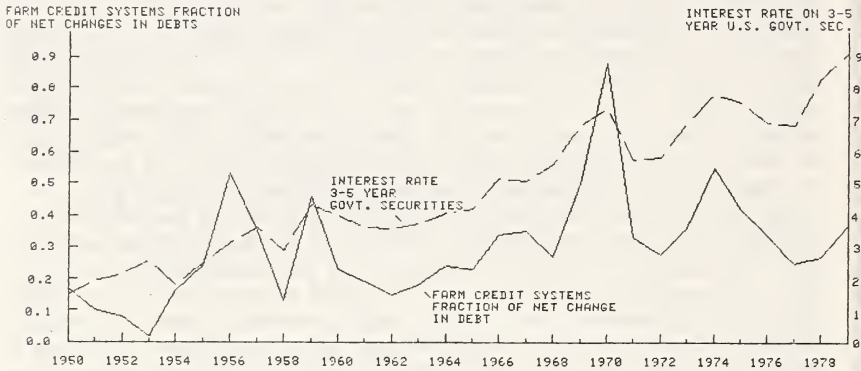
The big questions then relate to the supply side of the loan market and whether there will be a credit "crunch" in agriculture. There seems to be two different things which people mean when they use this fairly popular term "crunch." Some people simply mean high interest rates when they say "thus-and-so" group is facing a credit crunch. And, there is no doubt that farmers will be faced with higher interest rates next year. However, the term credit crunch really means more than high interest rates. It also deals with credit availability. The term was developed originally to describe the situation faced by people who desired single family dwelling mortgages in times of historically high interest rates. Since there exists really only one supplier of such funds, savings banks, who until recently have been highly regulated in terms of both what they could pay for funds and what they could charge on loans, there have been times when mortgages were not available—no matter what interest rates the borrower was willing to pay.

So, while credit "crunches" have occurred during periods of high interest rates, the term actually defines not the level of interest rates but a situation of quantity rationing that has happened in very specific circumstances. Therefore, if one asks if there will be a credit crunch in agriculture, he is really asking whether there will exist a situation where no matter what interest rates the farmer is willing to pay for a loan no moneys will be forthcoming. We do not believe that this will be the case next year. In fact, our projections show the rate of increase in debt financing to be higher next year than we expect to see this year. The reasons for this acceleration are twofold. As farmers go into next year, they will have just had 2 years of high net income and even if some marginal investments are postponed or canceled due to high interest rates they will likely continue the high rate of purchasing machinery and equipment that we are seeing this year, they will bid the price of land higher, and they will incur even higher expenses for their inputs. Each of these trends will be financed in part with new debt. However, if our forecasts for net farm income during 1980 are realized, farmers will find it difficult to continue repayments at the same levels as the past 2 years. Therefore, debt outstanding will increase more next year than it has in the recent past.

Where will farmers get these funds? It is clear from surveys done both by the Federal Reserve and the American Bankers Association that rural banks' loans to deposit ratios on average at 68 percent are higher than they would like to see and if there is no great unexpected influx of funds to these banks that much growth in loans from this source is unlikely. In other periods in history, banks have had to reduce loan volume because depositors have withdrawn funds to invest in other markets when interest rates have risen significantly above legally restricted savings account rates. However, to preserve deposits banks, under regulations that took effect during 1978, can now offer money market certificates at almost as high a rate of return as direct investment would provide. The recent American Bankers Association

survey shows over 85 percent of all banks responding offer the certificates and find their customers make extensive use of the opportunity to invest in them. The impact of these certificates will be to reduce some of the isolation that rural banks have had from savings in interest rates in the national money markets so that farm loan rates by banks will rise and fall further and at faster rates. But, it will mitigate some of the problems of credit rationing faced by rural borrowers in the past.

FIGURE 5. FARM CREDIT SYSTEMS' FRACTION OF NET CHANGE IN TOTAL DEBT AND INTEREST RATES



Increases in loan funds from insurance companies are likely to be small as well. Given very high interest rates, policyholders looking for better loan rates may borrow against their equity. Additionally, the national bond markets offer highly attractive alternative investments when competing against agricultural loans as a use of funds. Finally, both banks and insurance companies are running into legal problems in lending at current rates in some States due to usury laws. While many States have changed their laws recently, there are still some where agricultural lending by these suppliers has been curtailed and will continue to be small next year unless the laws are changed. The potential for problems exists in Alabama, Arkansas, Connecticut, Hawaii, Kansas, Louisiana, Nebraska, New Mexico, Ohio, South Carolina, South Dakota, and Wisconsin. Any of you living in those States should check your State's current laws and make farmers aware that such laws simply decrease competition among their lenders and reduce to some extent their available funds.

This leaves us with Government programs, the Farm Credit System and seller financing as sources of funds. Some of the Government programs which have expanded rapidly during the last few years such as the Farmers Home Administration may face more stringent rules in making loans and perhaps fewer funds as a result of the impact of unfavorable publicity just at the time Congress was reviewing their funding. And forecasting others such as Commodity Credit Corporation loans is risky without knowing what will happen to loan rates in the coming year.

We can say that Farm Credit loan volume is likely to increase substantially next year. The Farm Credit System's market share of loanable funds in agriculture always expands in periods of rising interest rates. As can be seen in figure 5, every time interest rates (the broken line) have been rising since 1955, the fraction of the net change in agricultural debt accounted for by the Farm Credit System (the solid line) has shown a rather dramatic increase. The system gets its funds directly from the national bond market where they can be considered perfect competitors for funds, that is they can raise any funds that they need at the going market interest rate. Therefore, when the Federal Reserve acts to tighten credit and the banking system reduces the growth rate if not the level of loans outstanding, the Farm Credit System will still have sufficient funds to service both its old customers and any who switch over from other lenders. Additionally, in periods of rising interest rates, Farm Credit enjoys an advantage over other lenders in that its rates are lower than their competitors. Because the interest rate on loans made by the System are based on the average cost of funds on all of the outstanding Farm Credit bonds, older bonds at lower interest rates keep loan rates rising more slowly than they do for other lenders. Of course the opposite is also true, in times of declining interest rates the Farm Credit System's loan rates drop more slowly than those of other lenders. But, if interest rates are falling there is no shortage of funds available to agriculture.

Seller financing also increases whenever banks are reluctant to make loans. Historically high interest rates are also expected to help in that sellers who do finance the purchase of their land can lock up a high nominal income stream over the life of the loan. And, if the seller expects inflation and, therefore, nominal interest rates to decline below the unprecedented levels of the present, the investment of his funds at today's interest rates will seem even better.

I do not want to leave you with the impression that we feel that the new Federal Reserve policies will have absolutely no impact on any farmer. While the farm production sector as a whole will not suffer greatly, there will be specific types of farmers who will be impacted adversely by the increased risks of our current economy. There will most likely be a decline in the number of new farmers—even from the low levels of entry that currently exist. Without a substantial amount of equity that existing farmers have built up over time, the new farm is an economically vulnerable enterprise. With lower farm incomes and tighter money next year, it is likely that bankers will feel that next year is not a good time to encourage new farmers. Second, existing farms that are trying to grow by use of debt financing do not conform with the earlier analysis showing interest cost on average are a small part of total expenses. Growing farms with high debt to equity ratios may well find their profits decreased substantially by higher interest rates and lenders will be reluctant to add to the farm's problems with more loans next year. Finally, there will be a few marginal farms that will find the smaller profits and higher cash flow requirements of next year too much to handle and will have to sell out. As has been happening for many years most of the resources that are transferred will move to established, well-managed farms which can get loans and, therefore, the efficiency of the whole sector may be helped.

In summary then, while farmers face the highest nominal interest rates of this century, the impact on agricultural borrowing will be slight. Real rates of interest are well within those that we have seen at times in the last 30 years and farmers' loan demand is justifiably insensitive to interest rate changes. While it may be necessary for farmers to shop around for loans there should be no problem in the aggregate for them to find sufficient funds to meet their demand. Funding increases will come from the Farm Credit System, and from seller financing of land purchases while commercial banks and insurance companies' agricultural loans should not increase significantly. While farmers as an aggregate should be able to adjust to the new higher interest rates without great difficulty the increases in financial risks of the new situation will have impacts on the number of new farmers, the ability of high leveraged farms to grow and some very marginal small farms might have to sell out to larger, more efficient units.

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DISCUSSION COMMENTS AT FARM INCOME AND
CREDIT SESSION [3]

(By John C. Moore, Farm Credit Administration)

I agree with Dean's comments that agricultural credit demand will grow in 1980. I'm not sure though that it will grow by more than in 1979 as he suggests. Certainly high production expenses combined with lower incomes will stimulate demand for production credit, and I agree that higher interest rates may not slow demand for short term credit. But I'm not sure the same can be said for real estate credit, a topic Dean did not directly address. I would expect continued increases in land values. The favorable longer term prospects for U.S. agriculture and the expectations of continued inflation should outweigh the short term adverse fluctuations in influencing land price increases in 1980. But high interest rates and poor cash flows in 1980 will probably reduce land transfer rates and keep percentage increases in real estate debt outstanding below those of 1979. Of course, increased need for refinancing of real estate loans to meet short term obligations may keep loans made gaining at a rapid pace.

1980 should be an interesting year to watch changes in market share. I agree with Dean in that Farm Credit System share of the net flow of debt will be high, though it may not be as high as in late 1979 and may be lower toward the end of 1980. Interest rates are expected to decline next year as slowed growth in the economy reduces upward pressure on loan demand. As Dean pointed out System rates typically move more slowly than rates of other lenders—giving the System its current competitive advantage but also giving an interest rate disadvantage depending on how fast rates decline. Of course, it's difficult to judge how much changing interest rates will affect System portfolio costs without also knowing the amount of new money demands placed on the System. One factor that may attract long-term borrowers to variable rate lenders in the very near future will be the good prospects for declines in interest rates later in 1980.

During 1979 the System increased its share of overall debt by picking up some borrowers other lenders could not serve. It will be interesting to see how many of these borrowers will eventually return to their former lenders as System rates become less competitive.

I'd like also to comment on Government lending activity. Almost all of the net increase in Government non-real-estate lending was through the FmHA. The major source was the economic emergency program, although I have never seen any figures showing how much of this credit is short versus long term. Credit through this program, now just a little over 1 year old, can be extended because of low commodity prices or a shortage of loan funds at reasonable rates from the bor-

rower's current lender. I do not know whether FmHA has attempted to measure the extent of participation caused by farmer distress versus lender distress in 1979, but strong farm income, general lack of credit quality problems, and the surge in capital spending point to lender distress as the cause for participation in 1979. The interest rate differential has, of course, also been a factor and a strong inducement for the direct lending option in this program. The availability of over \$3 billion of this credit during fiscal 1979 certainly must have helped alleviate the liquidity squeeze at commercial agricultural banks, it probably also helped these banks keep from losing borrowers to other commercial lenders such as the Farm Credit System, and it helped relieve the impact of rising rates. But the available EE money will soon be used up at existing rates of lending. What increases, if any, can we expect in authorizations for this program after May 1980—the program expiration date? The lower income prospects for 1980 make increases in authorizations a good possibility. But the prospect of stricter regulations and reduced interest rate differentials may change the use of this program considerably.

Another interesting trend to watch next year will be the response of merchants and dealers as well as private individuals in supplying credit during a period of high rates and tight commercial bank liquidity.

If projected income is as low as USDA suggests, 1980 may be a difficult year for many farm borrowers. The Farm Credit System can readily supply the funds demanded, but cash flows available for repayment may be quite depressed, particularly among some livestock and soybean producers. Intermediate, and long-term borrowers who made capital purchases several years ago financed by variable rate loans have seen their repayment obligations increase considerably above levels originally planned. For many borrowers, nonfarm income will provide additional cash flow needed to meet obligations. I wonder though whether even nonfarm income might be slightly depressed as unemployment rates rise.

A REVIEW OF SELECTED FARM FINANCIAL DEVELOPMENTS

(By Emanuel Melichar, Senior Economist, Board of Governors of the Federal Reserve System)

The first four sections of this paper review several farm finance trends and relationships that are important in formulating a financial outlook for 1980:

- (1) Capital gains in the farming sector;
- (2) Relative use of debt financing;
- (3) Liquidity trends at rural banks; and
- (4) Farm loan interest rates.

In each case, references are provided to papers that presented the underlying analyses as well as more extensive or detailed discussion. Copies of these publications are available from the author.

The concluding section of this paper discusses certain probable and important implications for farm financial and credit experience of the farm income forecast for 1980 that has been presented by USDA staff at this conference.

CAPITAL GAINS IN THE FARMING SECTOR

Large increases in the price of farm assets have led to huge nominal capital gains in recent years. But it is misleading to invite comparison of these gains with farm income, as is done in the top panel of figure 1. To obtain data on capital gains that are comparable with net income, the nominal gains must be adjusted for gains or losses resulting from changes in the general purchasing power of the funds tied up in assets or of the funds owed. The result of this procedure, known as "real capital gains" in agricultural finance literature, is shown in the middle panel of figure 1. Finally, for comparisons over time, the constant-dollar series shown in the bottom panel are most useful.

The results of the adjustments for general price inflation make it clear that a large part of recent nominal gains merely represented keeping up with inflation. Nevertheless, real capital gains were on average about as large as net farm income (which here includes landlords' net rent) during the 1970's.

Figures 1 through 3 update similar data and charts used in "Capital Gains Versus Current Income in the Farming Sector," a paper presented at the meeting of the American Agricultural Economics Association on August 1, 1979 (forthcoming, American Journal of Agricultural Economics, December 1979). One difference is that, in accordance with current USDA practice, the BLS consumer price index (for all items, all urban consumers) has now been used as the measure

of changes in the general price level (replacing the USDA farm family living index previously used). Additional detail on the computational methods and a critique of earlier literature on capital gains is provided by another paper, "Capital Gains in the U.S. Farming Sector, Nominal and Real, 1940-74," presented at the meeting of the American Agricultural Economics Association on August 11, 1975. The computation procedures and current and historical data for capital gains shown here are presented in tables 541 through 545 of *Agricultural Finance Databook—Annual Series*, issued periodically by the author.

Most real capital gains have arisen from increases in the price of farm real estate, which comprises about three-fourths of the value of farm assets. Several analysts have recently shown that the primary factor underlying real price increases of farm real estate has undoubtedly been rapid growth in the current income to owners of this asset. One approach, involving study of trends in cash rent received by farm landlords, has been employed by Robert Reinsel and Larry Walker of the USDA staff. Another approach, illustrated by figure 2, is based on study of the trend in the residual return to farm production assets, a series computed and published annually in the USDA's Balance Sheet of the Farming Sector. Note, in figure 2, that since the mid-1950's the return to assets has actually been rising somewhat faster than asset values.

The upper panel of figure 3 illustrates further the rapid growth exhibited by the current return to farm production assets. In constant dollars, the current return rose at an average annual rate of 4.3 percent over the 1954-79 period. As is demonstrated in the paper, "Capital Gains Versus Current Income in the Farming Sector," an asset that has been producing, and is expected to keep producing, such rapid growth in its current return will necessarily be priced at a relatively high multiple of that return, since its price will tend to rise at the same pace. In the language of the stock market, farm real estate is a "growth stock," whose owners obtain a significant proportion of their total return in the form of real capital gains. The lower panel of figure 3 indicates that, except in the late 1960's, real capital gains have on average been about equal to the current return since the midfifties. Given the real growth rate exhibited by the current return, this is about what one would expect on the basis of the asset-pricing model appropriate for an asset with a growing return.

This result has important implications both for farmland price analysis and for farm sector structure and policy. With past land price increases now viewed as theoretically consistent with the empirical record of the real current return, recent price levels can be regarded as based in large part on expectations of continued long-term growth in that return—which, in view of the past record, seems a reasonable "speculation." At the same time, however, the necessarily low current return to the market value of such an asset is an important source of many of the farming sector's concerns, such as cash flow problems, difficult entry, and the attraction of farm real estate for persons of large wealth or high income. Policy actions intended to address these concerns may actually aggravate such problems if they tend to increase the growth rate of the current return, which in the longer run would tend to reduce the rate of current return, on asset market values; thus, farm programs need to be designed to avoid this unintended effect.

RELATIVE USE OF DEBT FINANCING

Rapid increases in farm debt have led to concern about possible dangers inherent in recent levels of debt financing. The relatively low level of the sector's debt/asset ratio has been reassuring; however, this indicator should be supplemented by measures that yield insights into other aspects of increased debt financing.

The inherent productivity of increased debt financing can be in part assessed by examining whether it is financing increased capital formation or simply replacing internal financing of this capital flow. (Capital formation consists of expenditures for machinery, buildings, and land improvements plus the net change in financial assets and the value of net additions to inventories of livestock and stored crops.) The upper panel of figure 4 shows that increases in debt have recently been rising faster than capital formation; thus, as the lower panel indicates, debt financing has replaced internal financing to a highly unusual degree in the period starting in 1976. In this century, a comparably high ratio of debt financing to farm capital formation has previously occurred only once, during the ill-fated boom of World War I.

If capital flows are increasingly financed by borrowing rather than by saving from current income, more of the ultimate financing burden is being shifted to future income. While this course is warranted if future income gains are in prospect, figure 5 shows that increases in debt since 1976 have been far outside previous bounds of their relationship to farm cash flow and net income (cash flow consists of net farm income plus capital consumption allowances). Thus debt commitments are being incurred at a high rate relative to growth in the income flows from which they must be serviced.

A brief but relatively comprehensive discussion of the computation and uses of various indicators of relative debt financing appears in "Analytical Ratios Based on a Farm Sector Cash Flow Statement: Discussion," Proceedings of Workshop on Farm Sector Financial Accounts, Agricultural Economic Report 412, USDA, 1977. The historical development of such measures in agricultural finance literature is discussed in "The Farm Business Sector in the National Flow of Funds Accounts," 1970 Proceedings of the Business and Economic Statistics Section, American Statistical Association, 1971. These indicators of the relative usefulness and safety of ongoing increases in farm debt were employed in the articles "Farm Finance—Current Developments in Perspective," Agricultural Finance Commentary, November 1977 (mimeographed), and "Some Current Aspects of Agricultural Finance and Banking in the United States," American Journal of Agricultural Economics, December 1977.

LIQUIDITY TRENDS AT RURAL BANKS

Banks that are located in rural areas and that are heavily involved in financing agriculture often experience conditions that differ significantly from those at larger and more urban banks. This section discusses liquidity and interest-rate trends at such rural banks, as well as some evidence of the impact of these developments on farm borrowers.

In figure 6, the average loan/deposit ratio at agricultural banks is

compared with that at all other banks. On this chart, agricultural banks are defined as banks at which farm loans represent 25 percent or more of total loans. Nearly one-third of all commercial banks fall into this category, but together they account for only 6 percent of total banking resources; thus their liquidity experience is lost in aggregate banking data which are dominated by the larger, more urban banks. However, these agricultural banks hold 51 percent of all farm loans in the banking system, and so their condition has important implications for farm lending.

The chart shows that the liquidity of agricultural banks was largely unaffected during recent past cycles in the overall liquidity of the banking system. In 1976 and 1977, however, when adverse farm income developments led to slower rates of deposit growth and of farm loan repayment, the resulting increase in the average loan/deposit ratio at these banks was roughly comparable to that experienced at other banks during the monetary restraint of 1973-74.

Since the summer of 1977 there has been significant improvement in farm income. As yet, however, the trend toward reduced average liquidity at agricultural banks has not been reversed, primarily because deposit growth rates have not risen from the levels to which they fell in 1976 and 1977. Meanwhile, strong demand for both farm and non-farm loans has led total loans to rise faster than deposits, even though farm loan repayment rates have improved.

In figure 7, the same banking data are shown on a quarterly basis for the more recent period for which quarterly data are available. Since mid-1977 the average loan/deposit ratio has not risen as rapidly at agricultural banks as at other banks, which resembles experience during previous periods of monetary restraint. Nevertheless, after relatively modest seasonal improvement in liquidity last winter, the average loan/deposit ratio at agricultural banks had by September moved up to a new high level of 68 percent, about 12 percentage points above the average midsummer level maintained for many years prior to 1976.

Loan/deposit ratios are indicative of relative liquidity pressure and loan availability at all banks, but particularly at agricultural and other small banks that are generally unable to tap money-market sources of funds on a reliable basis or significant scale. In June 1979, large (\$100,000 or more) time certificates of deposit (both negotiable and nonnegotiable—breakdown is not available) constituted only 5.3 percent of total resources at agricultural banks, compared with 13.2 percent at other banks. These ratios have risen only slightly since the beginning of the adverse liquidity trend at agricultural banks. And, for most agricultural banks and other small banks, the Federal funds market remains a place to invest some liquid funds rather than a source of funds. On June 30, 1979, agricultural banks were net sellers of \$1.8 billion in Federal funds, equal to 2.3 percent of their total assets, while other banks were net buyers of \$61.9 billion, representing 5 percent of their total resources. Relative sales by agricultural banks have declined, however, from earlier levels around 4 percent of total assets. And, more agricultural banks have recently become net buyers of Federal funds. On June 30, 19 percent were net buyers, up sharply from levels under 12 percent in June of previous years (26 percent of non-agricultural banks were net buyers on June 30). The net purchases of

\$540 million by these agricultural banks represented 2.9 percent of their total resources.

Rural banking conditions often exhibit considerable regional variation which reflects geographical differences in agricultural developments. In each of the four Federal Reserve districts in which agricultural banks are concentrated, the Reserve banks conduct quarterly surveys of agricultural credit conditions that reveal such variation and also provide timely insights into the impact of liquidity and other trends on bank lending to farmers.

Figure 8 shows data from the Minneapolis survey, which covers a cross-section of banks involved in farm lending, including some of the larger banks. As shown by the solid lines on the chart, these ninth district banks as a group reached progressively tighter liquidity positions during the summer and fall of each of the past 3 years. As of the July 1979 survey, the proportion of banks reporting a "higher than desired" loan/deposit ratio rose above 50 percent for the first time in the history of this survey, which dates back to 1964.

The dashed line on the chart shows that one effect of this condition has been a rise in the proportion of banks that have refused or reduced a farm loan request because of a shortage of funds. Over time, responses to this and other survey questions about loan availability have been highly correlated with bankers' attitudes toward their loan/deposit ratios. Thus 34 percent of the banks expected to encounter problems in meeting normal farm loan requests during the fourth quarter of 1979, above the previous record of 30 percent that reported this condition in October 1974. On October 1, 1979, only 27 percent of the banks were actively seeking new farm loan accounts, which equaled the record low set in October 1974.

The next chart presents the results of similar surveys initiated more recently by the Federal Reserve Banks of Kansas City and Dallas, which cover primarily banks that are heavily involved in farm lending. In the Kansas City District, liquidity pressures at such agricultural banks mounted after wheat prices collapsed in the fall of 1979, and again when corn prices dropped sharply during the summer of 1977. The subsequent recovery in grain prices, the initiation of Federal payments to wheat producers, and the renewed availability of crop storage loans from the Commodity Credit Corporation combined to relieve liquidity conditions significantly at these banks. But, as the chart indicates, the proportion of banks reporting a loan/deposit ratio above the desired level rose sharply during the third quarter of this year. And, in the October 1 survey, only 34 percent said they were actively seeking new farm loan accounts, compared with 58 percent at the beginning of 1976.

The right-hand panel of figure 9 indicates that in the Dallas District, agricultural banks on average have somewhat lower loan/deposit ratios than in the more Northern Plains States, and that fewer of these banks now feel under liquidity pressure. The smaller role of wheat and corn production in this area helps to explain this experience, as it appears that the liquidity reductions at agricultural banks in other areas were triggered by the financial problems of these grain producers. During 1979, these Dallas District banks on average also indicated that farm loan demand was easing and that farm loan repayments were improving, which is contrary to the trends found by the other district surveys. In spite of these developments, however, the

proportion of banks that refused or reduced some farm loan requests because of a fund shortage remains above its 1976-77 level, and only about one-third of the banks have been actively seeking new farm loan accounts.

Much tighter conditions were reported by agricultural banks in the Corn Belt, as shown in figure 10. Many agricultural banks in the Chicago District experienced an undesired surge in their loan/deposit ratios after the 1977 drop in corn prices, and more recently liquidity pressures have increased still further. The prices and incomes of corn and soybean producers have not risen as much since 1977 as those of the wheatgrowers in the Great Plains area, who received a much greater boost from Federal farm programs. In addition, loan demands of Corn Belt livestock producers were spurred by the higher cost of feeder cattle and by expenses associated with expansion of hog production.

As shown on the chart, the proportion of agricultural banks in the Chicago District that consider their loan/deposit ratio to be undesirably high has exceeded 50 percent since the fall of 1978. At this level, many more banks are feeling such liquidity pressure than in either 1970 or 1974. Meanwhile, the imbalance between deposit growth and loan demand continues. In recent surveys, about three-fifths of the banks have been reporting greater demand for farm loans than a year earlier, while only about one-tenth of the banks have been indicating increased availability of funds for farm loans.

Interest rate trends at agricultural banks also often differ markedly from those at large banks, and the Federal Reserve System's relatively new "Survey of Terms of Bank Lending to Farmers" is helping to track these variations. As figure 11 indicates, the average farm loan rate at large banks has risen in line with increases in the national prime rate, while the average at other banks has risen less and more slowly. Since the bottoming out of average farm loan rates 2 years ago, the increase at large banks up to August 1979 had totaled 480 basis points, compared with 202 basis points at other banks. The difference in behavior tended to occur at bank asset size of about \$400 million, which is also roughly the size at which banks begin to make significant use of money-market sources of funds.

The new survey data also reveal that interest rate averages are now far less indicative of individual farm credit costs than they were a year or two ago. As shown in table 1, the range of rates charged on individual farm loans has widened greatly. In February 1977, a range of 3 percentage points—from 7.0 to 9.9 percent—encompassed 95 percent of the dollar amount of all loans made. But by 1978 the equivalent range had doubled, with significant amounts of farm lending in August occurring at rates ranging from 9 to 15 percent. Thus, while some farm borrowers have experienced increases no greater than 200 basis points, others have faced increases as large as 600 basis points.

The greater overall dispersion of farm loan rates has arisen in part because the difference between rates at large and smaller banks has widened. In August 1979, 78 percent of the volume of farm loans made by large banks was at an effective rate of 12 percent or higher, while 86 percent of the loan volume at smaller banks carried rates below 12 percent—and most were made on a fixed-rate basis. However, the range of rates on loans made by the smaller banks has also increased considerably since mid-1978, and this has contributed significantly to the greater overall variation.

While average farm loan rates at small banks have risen much less than at large banks, data from the Reserve bank surveys indicate that the increase at rural banks has actually been relatively large and rapid compared with previous periods of monetary restraint. For instance, the average "typical" rate charged on feeder cattle loans by banks surveyed in the Chicago District had by October 1 already risen by 294 basis points since the lows of 1977, compared with total increases of 142 and 161 basis points during the 1967-70 and 1972-74 upswings, respectively. At banks in the Minneapolis survey, the average "most common" rate on short term farm loans had risen by 281 basis points since its 1975 low, compared with a total rise of 109 basis points during the 1972-74 period.

As a factor contributing to increased cyclical variation in their farm loan rates, rural banks have noted that the new 6-month money-market certificate of deposit, which most rural banks are offering, has exposed their banks to significant cyclical change in the cost of their loanable funds. At the end of June 1979, about 1 year after their introduction, these certificates comprised 8.5 percent of the total resources of agricultural banks nationally (banks at which farm loans represent one-fourth or more of total loans), compared with 4.2 percent at other banks. At some agricultural banks the proportion was considerably above this average. Thus most agricultural banks probably encountered a greater degree of cyclical cost pressure on their loan rates than they had previously experienced.

Over the past two decades, a sequence of structural changes in the practices of and regulations affecting financial institutions has probably resulted in greater cyclical variation in interest rates. A discussion of these changes and their consequences is presented in "Farm Risks from Instability in Financial Markets," from "Risk Management in Agriculture: Behavioral, Managerial, and Policy Issues," Peter J. Barry, editor, AE-4478, Department of Agricultural Economics, University of Illinois, July 1979.

For many farm borrowers at nonbank lending institutions such as the Farm Credit System and the Farmers Home Administration, interest rates presently remain at relatively low levels. Under the variable rate plans of the Farm Credit System banks, all borrowers with outstanding loans are charged rates that reflect the average cost of funds. Changes in these rates thus lag behind changes in money-market rates, especially at the Federal land banks, as shown by the last two columns of table 2.

During periods of relatively high interest rates, it is also important to remember that sellers of farms are the largest source of financing for farm real estate transfers. These individuals often want to finance their sales because of income tax considerations. During previous cyclical upswings in interest rates, the rates negotiated on these transactions apparently rose relatively slowly, perhaps primarily in step with changes in rates charged by the Federal land banks. Similar experience can be expected in this cycle.

With the exception of the business loan rates in the first two columns of the table, the last entries all predate the Federal Reserve System's policy actions of early October. Further increases in farm loan rates have therefore undoubtedly occurred at many rural banks and other farm lending institutions. And, given the various lags that have been noted, further near-term increases can be expected.

TABLE 1.—PERCENTAGE DISTRIBUTION OF FARM PRODUCTION LOANS AT BANKS, BY EFFECTIVE INTEREST RATE^{1 2}

Effective interest rate (percent)	February 1977	May 1977	August 1977	November 1977	February 1978	May 1978	August 1978	November 1978	February 1979	May 1979	August 1979
All loans.....	100	100	100	100	100	100	100	100	100	100	100
Under 7.....	1	7	2	3	1	35	20	8	4	4	2
7 to 7.9.....	8	6	11	42	38	35	20	32	17	14	11
8 to 8.9.....	46	43	48	48	50	48	50	48	35	32	29
9 to 9.9.....	41	40	34	7	9	11	22	11	37	22	33
10 to 10.9.....	3	3	4	1	1	6	6	11	19	12	14
11 to 11.9.....	---	1	---	---	---	---	1	7	12	10	7
12 to 12.9.....	---	---	---	---	---	---	---	4	6	5	5
13 to 13.9.....	---	---	---	---	---	---	---	---	6	1	1
14 to 14.9.....	---	---	---	---	---	---	---	---	1	---	---
15 and over.....	---	---	---	---	---	---	---	---	---	---	---
Addendum: Average effective interest rate (percent) ² at:											
All banks.....	8.82	8.74	8.73	9.06	9.16	9.31	9.62	10.36	11.01	11.20	11.28
Large banks ³	8.34	8.08	8.40	9.13	9.32	9.61	10.37	11.73	12.53	12.82	12.88
Other banks.....	8.95	8.95	8.91	9.06	9.11	9.17	9.34	9.98	10.45	10.71	10.93

¹ Percentage distribution of the total dollar amount of nonreal estate farm loans of \$1,000 or more made by insured commercial banks during the week covered by the survey.

² The approximate compounded annual interest rate on each loan is calculated from survey data on the stated rate and other terms of the loan. In computing the average of these estimated effective rates, each loan is weighted by its dollar amount.

³ "Large banks" are banks in survey strata 1-3, corresponding approximately to banks with over \$400,000,000 in total assets as of September 1978.

Source: Federal Reserve quarterly survey of terms of bank lending to farmers.

TABLE 2.—AVERAGE INTEREST RATES ON BUSINESS AND FARM BORROWINGS

[In percent]

Year/quarter	Prime 4- to 6-mo commercial paper ¹	Business loans at banks ²		Farm loans at banks					Farm credit system ⁷	
		Prime rate, large banks	Average, all banks ³	Short-term farm loans, 9th district ⁴	Feeder cattle loans 7th district ⁵	Non-real-estate farm loans, United States ^{2,3}			Production credit associations	Federal land banks
						Large banks ⁶	Other banks	All banks		
1976/4	5.2	6.25		9.2	8.8				8.2	8.6
1977/1	4.7	6.25	7.6	9.2	8.7	8.3	8.9	8.8	8.2	8.5
1977/2	4.9	6.25	7.6	9.2	8.7	8.1	8.9	8.7	8.1	8.4
1977/3	5.4	6.75	7.9	9.2	8.7	8.4	8.4	8.7	8.9	8.3
1977/4	6.6	7.75	8.6	9.2	8.8	9.1	9.0	9.1	8.0	8.3
1978/1	6.8	8.00	8.9	9.2	8.9	9.3	9.1	9.2	8.4	8.2
1978/2	6.9	8.00	9.1	9.2	8.9	9.6	9.2	9.3	8.7	8.3
1978/3	7.9	9.00	10.0	9.4	9.1	10.4	9.3	9.6	9.0	8.3
1978/4	9.0	10.50	11.4	9.5	9.4	11.7	10.0	10.4	9.2	8.4
1979/1	10.3	11.75	12.2	10.2	10.1	12.5	10.4	11.0	10.0	8.7
1979/2	9.9	11.75	12.3	10.4	10.5	12.8	10.7	11.2	10.6	9.0
1979/3	9.8	11.75	12.3	10.8	10.8	12.9	10.9	11.3	10.9	9.3
1979/4	13.2	13.25		11.8	11.7				11.0	9.3

¹ Average, first month of quarter.² First full business week of second month of quarter.³ Dollar-weighted average of effective rates on loans of \$1,000 or more made in the week indicated.⁴ Average of most common rates at banks representative of farm lending, first day of quarter.⁵ Average of typical rates at agricultural banks, first day of quarter.⁶ "Large banks" (survey strata 1-3) correspond roughly to banks with over \$400 million in total assets in 1978.⁷ Unweighted average of quoted rates, first day of quarter (calculated by the authors). Stock purchases required of borrowers from these cooperatives are not taken into account in the rates shown.

TABLE 3.—ESTIMATED PERCENTAGE CHANGES IN INCOME FLOWS, 1979-80, IMPLIED BY USDA FORECAST OF \$25,000,000,000 FOR OPERATORS' NET FARM INCOME IN 1980, BY VALUE-OF-SALES CLASSES AS OF 1978

Type of income flow	Value of sales in 1978 (dollars)							Under 2,500
	All farms	100,000 and over	40,000 to 99,999	20,000 to 39,999	10,000 to 19,999	5,000 to 9,999	2,500 to 4,999	
Farm income:								
Net income:								
Total.....	-19	-33	-13	-11	-12	-12	-11	-1
Money.....	-32	-38	-18	-18	-33	Loss	Loss	Loss
Cash flow:								
Total.....	-7	-20	-6	-3	-2	-1	1	6
Money.....	-13	-22	-8	-5	-7	-9	-12	-3
Farm and off-farm income:								
Net income:								
Total.....	-3	-26	-8	-2	3	7	9	10
Money.....	-4	-29	-10	-4	1	7	9	11
Cash flow:								
Total.....	0	-16	-3	1	4	7	9	10
Money.....	-1	-18	-4	0	4	7	9	11

TABLE 4.—ESTIMATED PERCENTAGE CHANGES IN INCOME FLOWS, 1979-80, IMPLIED BY A FORECAST OF \$20,000,000,000 FOR OPERATORS' NET FARM INCOME IN 1980, BY VALUE-OF-SALES CLASSES AS OF 1978

Type of income flow	Value of sales in 1978 (dollars)							Under 2,500
	All farms	100,000 and over	40,000 to 99,999	20,000 to 39,999	10,000 to 19,999	5,000 to 9,999	2,500 to 4,999	
Farm income:								
Net income:								
Total.....	-36	-58	-25	-21	-23	-26	-23	-4
Money.....	-56	-65	-33	-32	-56	Loss	Loss	Loss
Cash flow:								
Total.....	-19	-36	-14	-10	-9	-7	-4	4
Money.....	-25	-39	-17	-13	-15	-21	-26	-15
Farm and off-farm income:								
Net income:								
Total.....	-10	-47	-17	-9	-2	4	8	10
Money.....	-13	-45	-21	-12	-4	3	7	10
Cash flow:								
Total.....	-5	-31	-10	-4	1	5	8	10
Money.....	-8	-33	-12	-5	0	5	8	10

TABLE 5.—PERCENTAGE DISTRIBUTION OF SELECTED INCOME AND BALANCE SHEET ITEMS, BY VALUE-OF-SALES CLASSES AS OF 1978

Item	Value of sales in 1978 (dollars)							Under 2,500
	All farms	100,000 and over	40,000 to 99,999	20,000 to 39,999	10,000 to 19,999	5,000 to 9,999	2,500 to 4,999	
Number of farms.....	100	7.0	14.6	12.1	11.1	10.5	10.4	34.3
Cash receipts.....	100	56.3	25.0	9.9	4.5	2.2	1.1	.9
Production expenses.....	100	57.6	22.6	8.9	4.5	2.6	1.6	2.3
Real estate.....	100	33.5	22.5	13.5	8.1	5.5	4.8	12.1
Machinery.....	100	28.6	27.2	15.0	8.5	5.6	4.3	10.8
Nonmoney income.....	100	11.9	17.5	12.0	9.9	9.3	9.2	30.2
Off-farm income.....	100	5.9	7.8	7.4	8.7	11.1	13.1	46.0
Outstanding debt.....	100	38.7	32.1	15.6	5.1	3.0	2.0	3.6

TABLE 6.—NATIONAL DATA AND PROJECTIONS UNDERLYING THE RESULTS REPORTED IN TABLES 3 AND 4

[In billions of dollars]

Item	1978	Estimated, 1979	USDA fore- cast, 1980	Low forecast, 1980
Net income.....	27.9	31.0	25.0	20.0
Nonmoney income.....	9.1	9.8	10.6	10.6
Money net income.....	18.7	21.2	14.4	9.4
Production expenses.....	98.1	114.0	125.0	128.0
Cash receipts.....	116.8	135.2	139.4	137.4
Capital consumption allowances.....	16.1	18.6	20.4	20.4
Money net income.....	18.7	21.2	14.4	9.4
Money cash flow.....	34.9	39.8	34.8	29.8
Nonmoney income.....	9.1	9.8	10.6	10.6
Cash flow.....	44.0	49.6	45.4	40.4
Off-farm income.....	34.3	38.0	42.2	42.2
Money net income.....	18.7	21.2	14.4	9.4
Combined money net income.....	53.0	59.2	56.6	51.6
Nonmoney income.....	9.1	9.8	10.6	10.6
Combined net income.....	62.2	69.0	67.2	62.2
Capital consumption allowances.....	16.1	18.6	20.4	20.4
Combined money net income.....	53.0	59.2	56.6	51.6
Combined money cash flow.....	69.2	77.8	77.0	72.0
Nonmoney income.....	9.1	9.8	10.6	10.6
Combined cash flow.....	78.3	87.6	87.6	82.6

Note the following special definitions for some items: "Net income" and "money net income" includes the value of any additions to inventories of livestock and stored crops; "nonmoney income" includes only the imputed rental value of operators' dwellings and the value of farm products consumed in farm households; "cash receipts" includes the change in inventories, government payments, and "other" farm income.

Figure 1

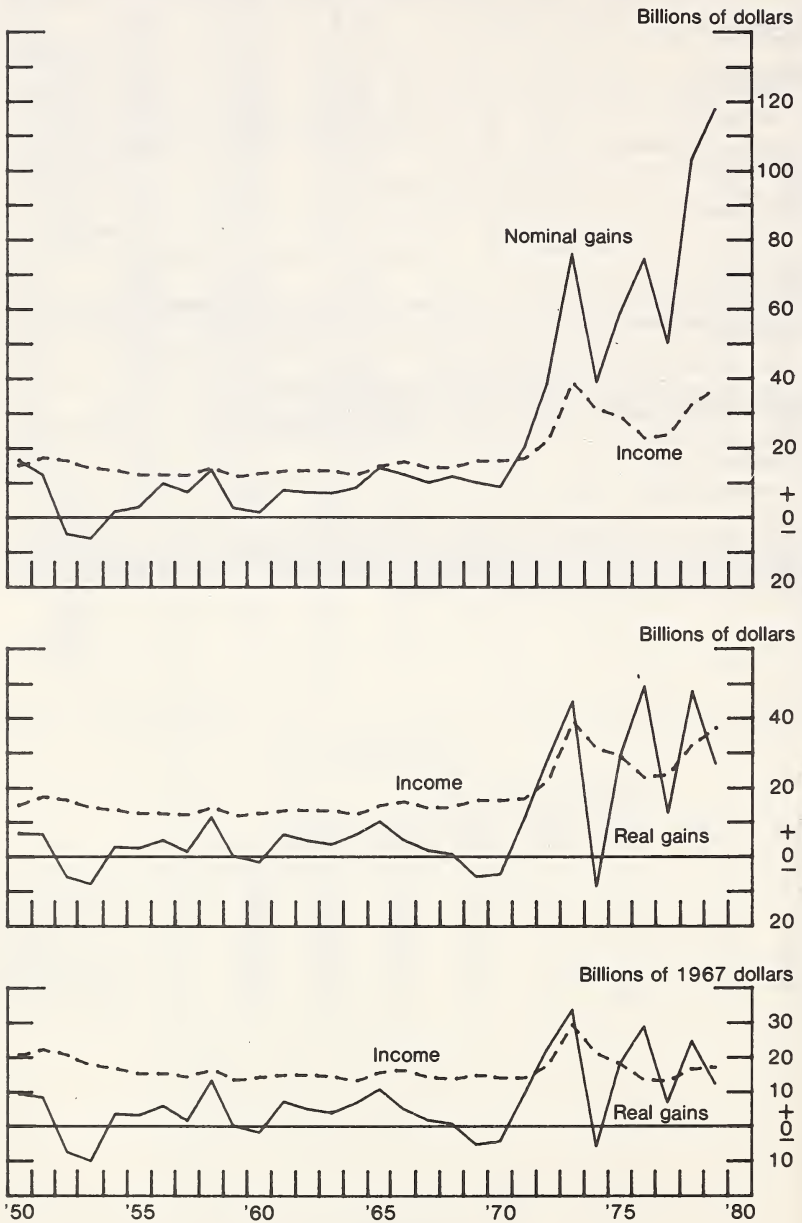
Capital gains compared with net farm income

Figure 2

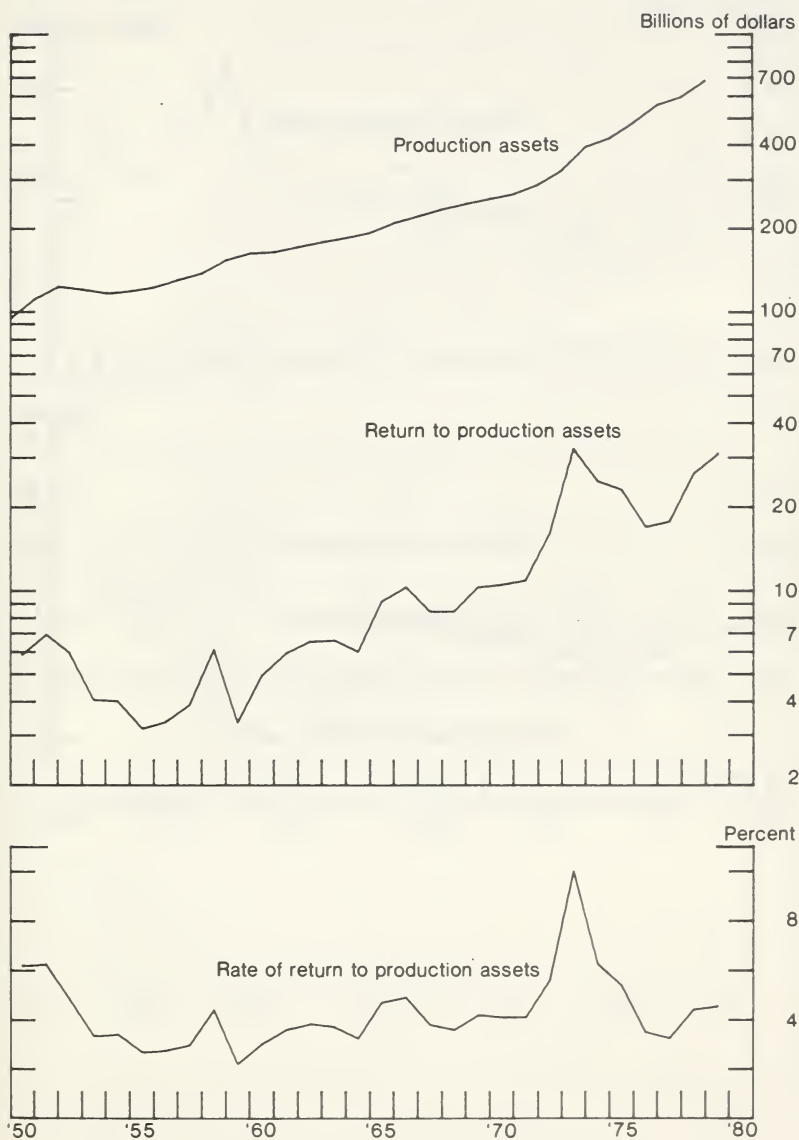
Return to assets compared with asset values

Figure 3

Return to assets compared with real capital gains
1967 dollars

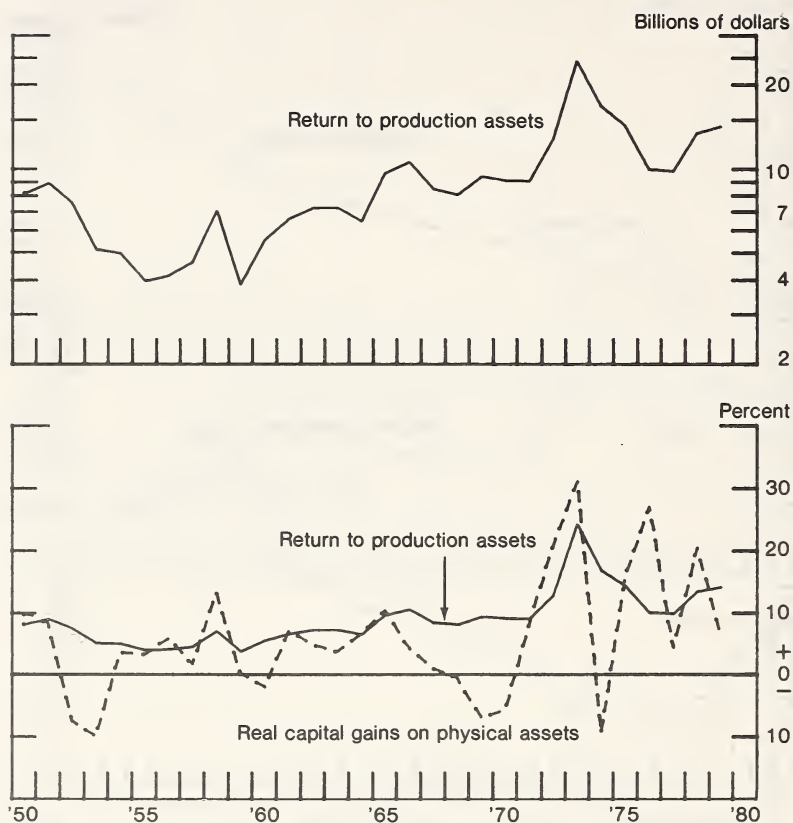


Figure 4

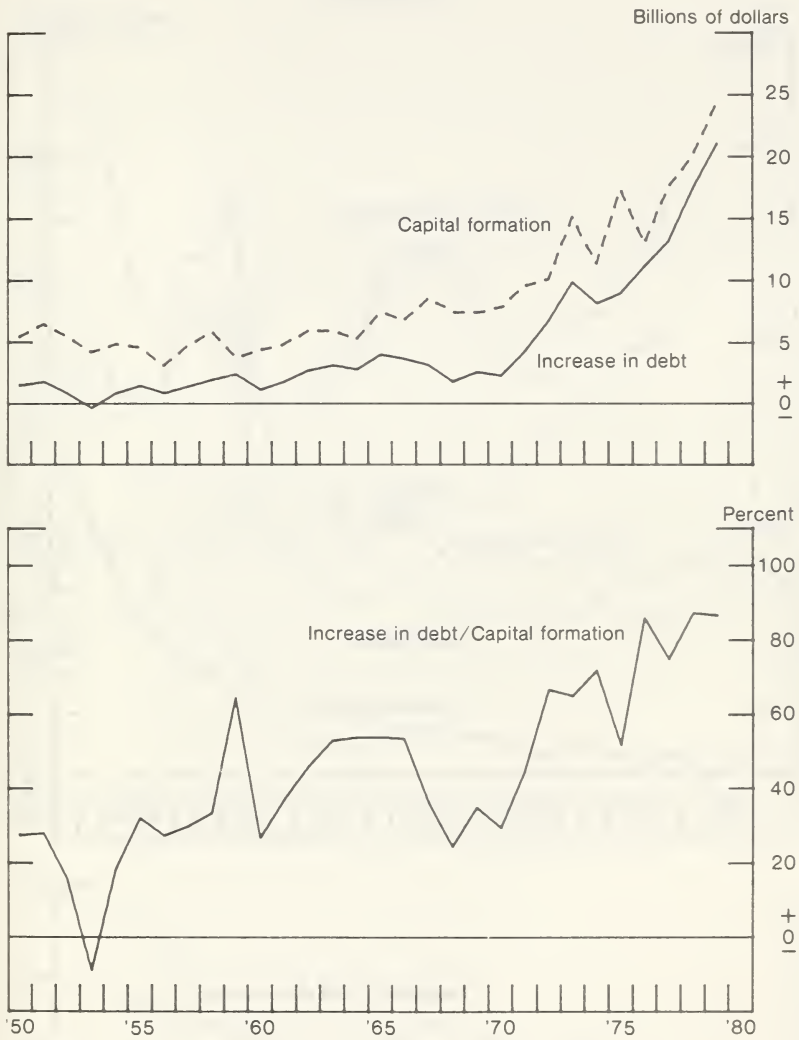
Debt financing compared with capital formation

Figure 5

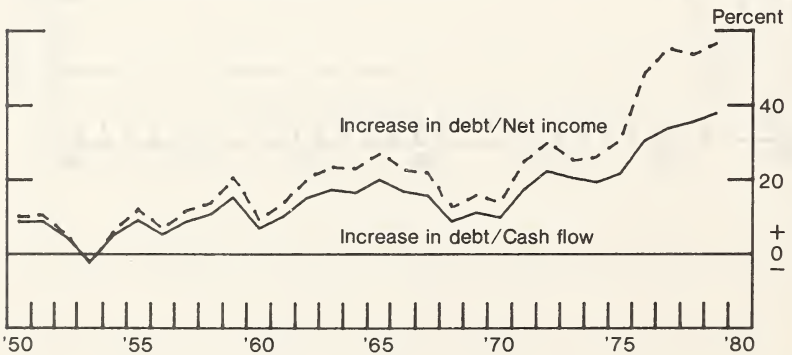
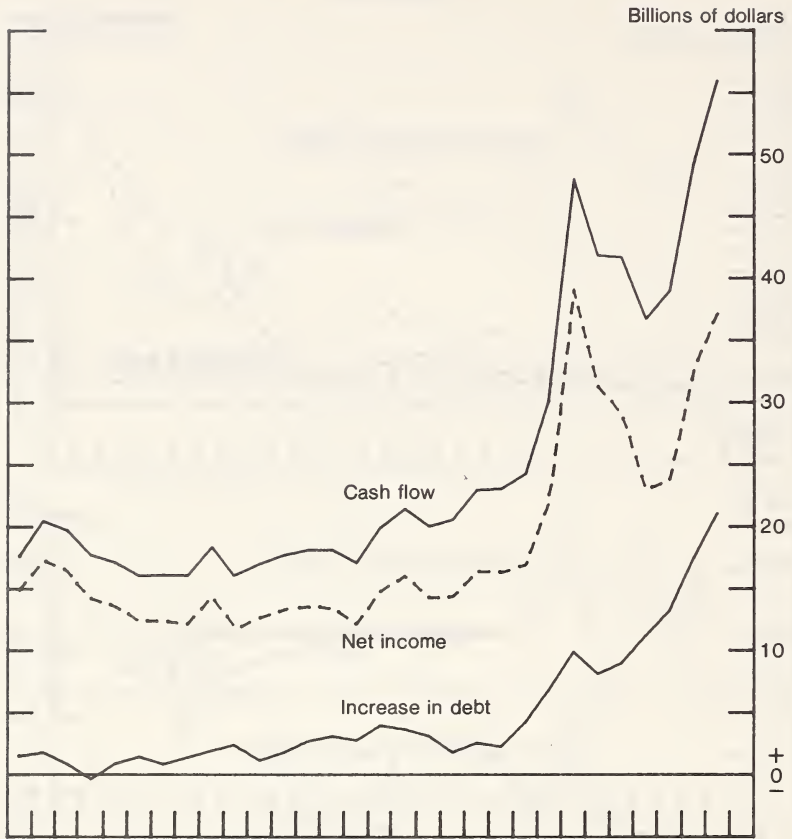
Debt financing compared with income flows

Figure 6

Average loan/deposit ratio at insured commercial banks
Semiannual



Figure 7

Average loan/deposit ratio at insured commercial banks
Quarterly

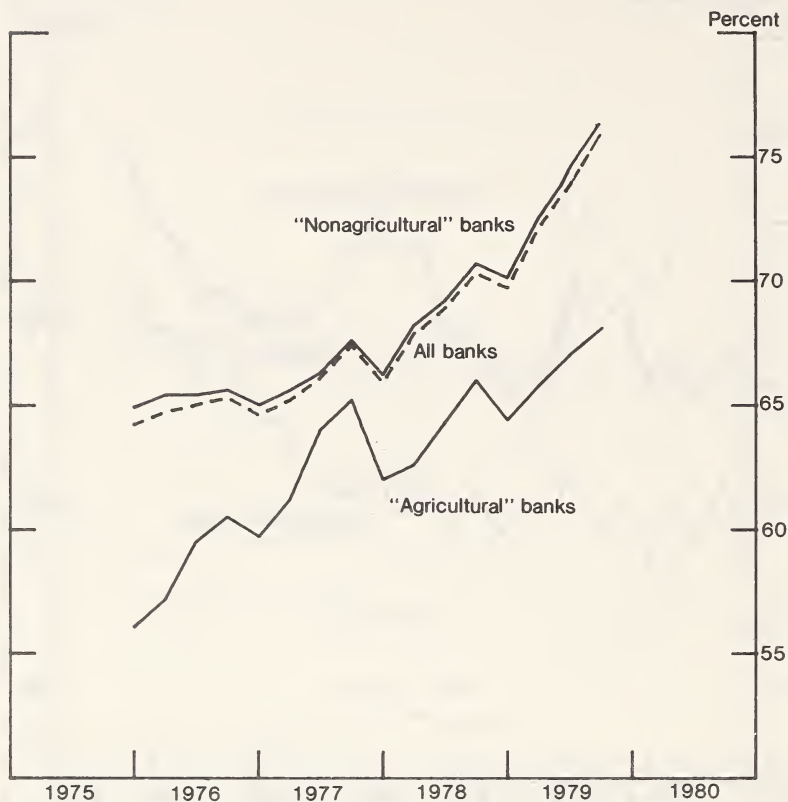
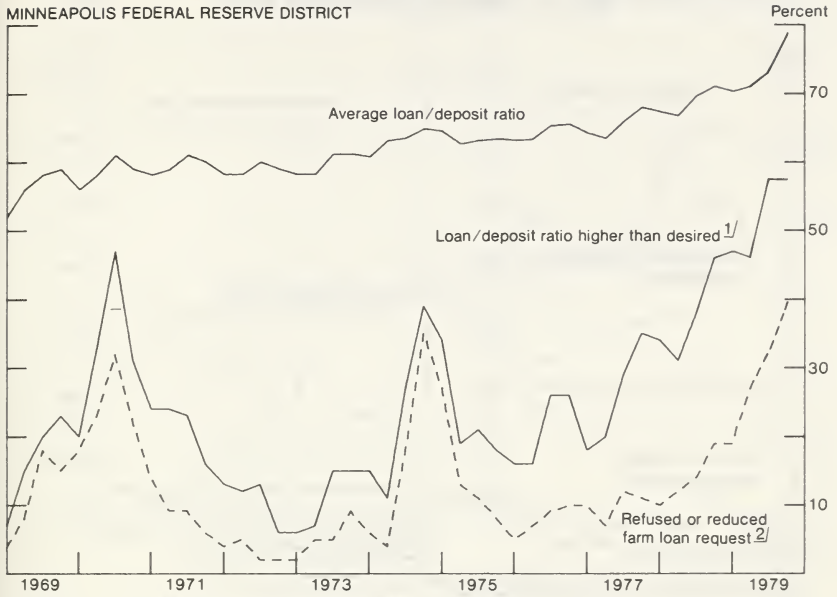


Figure 8

Liquidity conditions at bank active in farm lending

MINNEAPOLIS FEDERAL RESERVE DISTRICT



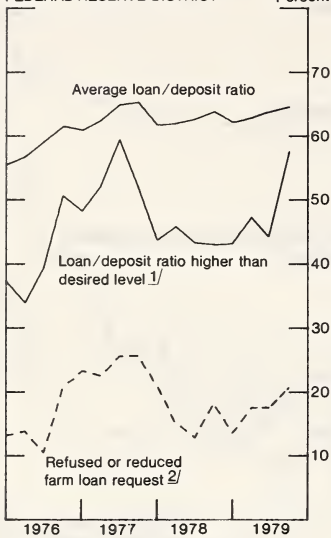
Source: Survey of Agricultural Credit Conditions, Federal Reserve Bank of Minneapolis

1/ Percentage of banks reporting that loan/deposit ratio is higher than desired

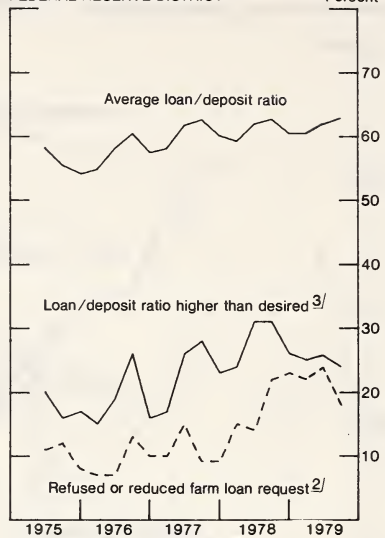
2/ Percentage of banks that refused or reduced a farm loan request during the previous quarter because of a shortage of funds

Figure 9

Liquidity conditions at agricultural banks

KANSAS CITY
FEDERAL RESERVE DISTRICT

Source: Quarterly Survey of Agricultural Credit Conditions, Federal Reserve Bank of Kansas City.

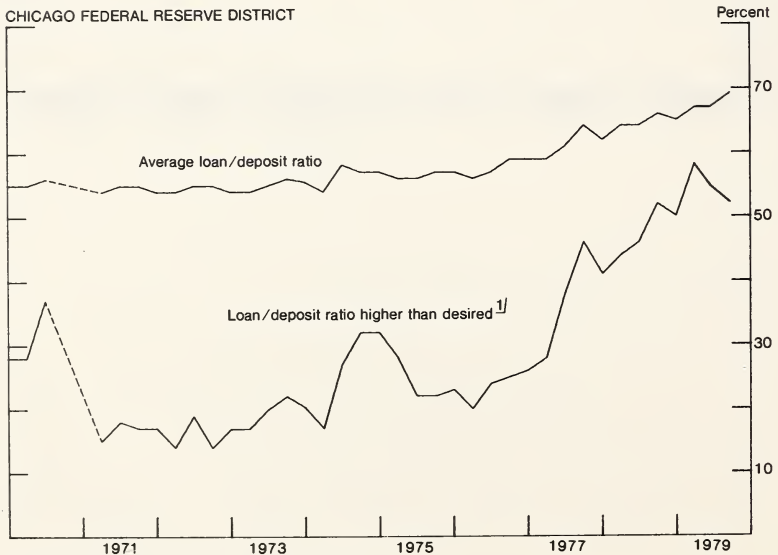
^{1/} Percentage of banks reporting a loan/deposit ratio that is higher than the level they reported as most desirable^{2/} Percentage of banks that refused or reduced a farm loan request during the previous quarter because of a shortage of funds.^{3/} Percentage of banks reporting that loan/deposit ratio is higher than desiredDALLAS
FEDERAL RESERVE DISTRICT

Source: Quarterly Survey of Agricultural Credit Conditions, Federal Reserve Bank of Dallas.

Figure 10

Liquidity conditions at agricultural banks

CHICAGO FEDERAL RESERVE DISTRICT

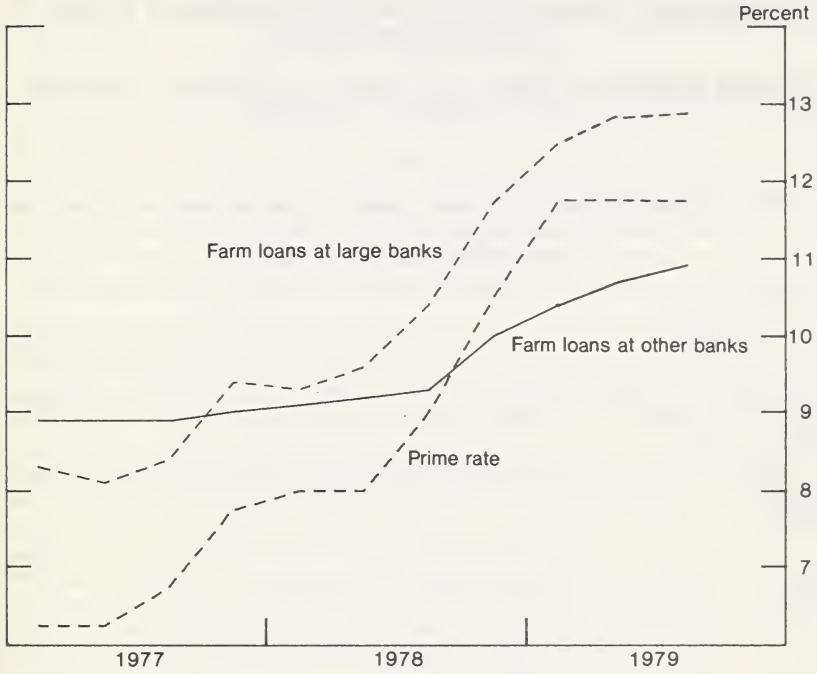


Source: Land Value and Credit Conditions Survey, Federal Reserve Bank of Chicago

^{1/} Percentage of banks reporting that loan/deposit ratio is higher than desired

Figure 11

Interest rates charged by commercial banks
First Week of Second Month of Quarter



Source: Federal Reserve Quarterly Survey of Terms of Bank Lending to Farmers.

"Large banks" are banks in survey strata 1-3, corresponding approximately to banks which now have over \$400 million in total assets.

A REPORT ON SERVICES OF THE FARMERS HOME ADMINISTRATION

(By James E. Thornton, Associate Administrator, Farmers Home Administration,
U.S. Department of Agriculture)

The Farmers Home Administration has performed a larger role this year in meeting the credit needs of American farmers. This has come about through our administration of two types of emergency programs, as well as traditional services to family farmers and other special needs.

Farmers Home credit is a supplement to all the financing available from lenders in the private sector. In the light of current developments in commercial credit, with prime rates above 15 percent and a tightening money supply, we foresee a year of increasing demand for FmHA loans in 1980.

However, circumstances may instead reduce the total volume of our programs. One major farm loan authority is scheduled to expire in May.

In any event, we are committed to our best possible effort to target FmHA resources toward the areas and people of greatest need. We hope to widen the private lender's use of FmHA loan guarantees. We will also emphasize support of new sources of energy and new energy-saving equipment that could help to relieve the high overhead that now encumbers the farmer.

THE FMHA SHARE OF U.S. FARM CREDIT

During the past 14 months, about \$3 $\frac{1}{3}$ billion has been added to the Nation's pool of farm credit by the economic emergency (EE) loan program, which is authorized until May 15, 1980 under the Agriculture Credit Act of 1978.

This EE loan was the principal factor in raising FmHA farm lending to a record high of \$7.7 billion in fiscal year 1979, as compared to \$5 billion in fiscal 1978. In recent years, as FmHA was given more and more responsibility in rural housing, rural community facilities and rural business and industry, farm credit dropped to a position representing only about one-fourth of the agency's annual business. But in fiscal 1979, it represented 57 percent of all the FmHA credit dispensed in a \$14 billion record year.¹ Besides \$3 billion of EE in the 1979 year, we loaned nearly \$2.9 billion to farmers eligible for emergency credit to recover from natural disasters, and \$1.7 billion through our regular farm loan programs.

¹ See table I attached.

This, of course, does not lift FmHA out of its supplemental position among agricultural lenders. To put the FmHA share of the entire national agricultural credit supply in perspective—

FmHA loans will account for 5.3 percent of all outstanding farm real estate debt projected for next January 1, and 13.2 percent of all non-real-estate debt, according to estimates presented to this conference by USDA's Economics, Statistics, and Cooperatives Service (ESCS).²

The real estate share is down four-tenths of a percentage point from 1 year ago, but the non-real-estate share is up by $4\frac{3}{10}$ ths points. In the combined category of all farm credit, FmHA accounts for 9.2 percent as compared to $7\frac{1}{2}$ percent 1 year ago. All of the emergency loans are included in the non-real-estate column because, although some are secured by real estate, they cannot be used for enlargement of a farm.

ECONOMIC EMERGENCY LOANS

FmHA's rising volume reflects the impact of recent cost inflation in farming, and limitations on the amount of financing that the private sector could make available.

The EE loan was created as a source of help to farmers who found themselves victim of a drying-up of credit from lenders they normally do business with, or an overload of debt they could not meet due to insufficient income. EE has been a source for refinancing this debt on more manageable terms. It has enabled many farmers to stabilize their finances, and continue to get credit for annual production expense from their conventional lenders. There is a \$400,000 limit on the EE loan.

With respect to farm income, improvement has occurred this year in farm prices. However, the \$4 billion ceiling on EE loans outstanding—a limit imposed by the Credit Act—appears to have been a fairly close estimate of the need still existing in 1979.

About 50,000 farmers have taken out EE loans since this program began in late August 1978. They have used about \$3.3 billion of the authorization. We estimate that the \$4 billion limit will be reached early in 1980, after which we can lend only what we have collected on previous loans. And under terms of the legislation as it now stands, the EE program will expire next May 15.

Congress is just at the point of taking up the question whether the program should be extended.

DISASTER EMERGENCY LOANS

Biggest of all the FmHA farm loan programs over the past 3 years has been the disaster emergency loan. It has accounted for \$71½ billion of the \$15 billion we have loaned to farmers in the fiscal years 1977 through 1979.

This year, a phenomenon appeared in this program that aroused concern in the Department, the agency, and the Congress. It is the multimillion-dollar emergency loan to the multimillion-dollar size operation that prevails in some agricultural areas, especially the State of California. Some of the big loans were depicted to the public, in tones somewhat more vivid than real life, on a segment 3 weeks ago of the television program "60 Minutes." The program stirred its huge

² See table II attached.

audience with a presentation of the question, why has FmHA abandoned the poor farmer and eloped with the rich?

I can summarize very briefly why the big loans were made. It is because, to the best determination of the agency, the individual, partnership, and corporate applicants met the rules of eligibility based on the law.

The present statutes impose no limit on size of loan, or size of borrower in this program. Loans are authorized to be made to farm, ranch, or aquaculture operators who have suffered substantial loss from natural disaster, and cannot get the necessary credit elsewhere to restore operations to the predisaster level. Loans are authorized for the three purposes of offsetting actual loss, financing resumption of annual operations, and making adjustments in the farming operation found necessary in the wake of a disaster.

As several exceptionally large loans developed early this year, especially in California fruit, vegetable, and cotton areas that had been assaulted by adverse weather, we became concerned in the Department whether loans of this magnitude were fully consistent with the original philosophy of the disaster loan program. The fundamental concept is to help farmers who have no other means for surviving disaster.

Secretary Bergland's premise is that the country would be better served if farm disaster losses were covered by insurance, not Government loans. Efforts are being made to develop a more universal system of farm disaster insurance, and legislation toward that end is now before the Congress.

However, we still have the disaster loan program and its very broad, open-ended authorizations.

During the past summer, we developed in the Department a number of recommendations that include statutory limits on the size of emergency loans, and tighter procedures to insure effective application of the test-for-credit rule.

Among the procedural changes proposed are—

Stronger requirements for verifying that adverse weather has created a disaster situation;

Denial of loans if an applicant could derive the funds needed by selling all or part of nonessential property not needed to support the farming operation. Until now, applicants have not been required to sell such property if it yields income that would contribute to the applicant's ability to repay an emergency loan; and

More vigorous enforcement of the so-called graduation provision contained in all FmHA loan contracts. This specifies that the borrower will refinance with another lender as soon as he or she is in position to do so.

Necessary changes in the law have been recommended to Congress, in order to establish loan limits and reduce the period during which a farmer might operate on emergency credit. The Department has recommended a limit on amount of the 5-percent interest loan offsetting actual loss, and a \$1 million limit on market-rate credit for operating and major-adjustment purposes; or, a limit of \$2.5 million on production and adjustment credit extended by a private lender and guaranteed by FmHA.

Another statutory change recommended would reduce from 5 to 2 years the number of years for which borrowers holding initial loans could get followup loans for annual operating purposes.

I have one reservation on the recent media reporting on big loans. It is a disservice to FmHA, to our conscientious and hardworking people in the county offices, to imply that Farmers Home has deserted its original mission as a lender to people of modest means and genuine need, and has let itself become a grab bag for the rich.

The real nature and intent of the disaster emergency loan program is seen in the fact that 99 percent of all loans outstanding are for less than \$500,000, and 57 percent are for less than \$30,000. Only about 300 out of 95,000 borrowers outstanding have balances of more than \$1 million. And although the big loans are made to very large ownership entities, they apply to operations that furnish the livelihood of hundreds, sometimes thousands of farmworkers.

We do not believe that the circumstances resulting in these large loans should obscure Farmers Home's priority for serving the 97 percent of American farmers who are engaged in relatively small-scale agriculture.

CURRENT BUDGET AND INTEREST RATES

In the coming year, FmHA will maintain its regular credit services at a slightly higher budget level than in 1979.³

On November 1, our interest rates were raised 1 point to keep pace with the Government's cost of money that sustains our loan revolving funds. The rates are now 10 percent for real estate loans, and 10½ percent for non-real-estate farm operating credit.

LIMITED-RESOURCE LOANS

Our role as the lender of last resort to the family farm of limited means takes on added significance under present credit market conditions. We adhere to the policy of targeting FmHA resources toward those of greatest need. Under the Agriculture Credit Act of 1978, we have introduced a new service in reduced-interest loans to limited-resource farmers, giving them an opportunity to build from meager beginnings until they develop farms that are strong enough to use market-rate financing.

One-fourth of our farm ownership and operating loan funds are targeted toward limited-resource borrowers. This is a program that calls for renewed effort by our county supervisors to provide the in-depth technical assistance that characterizes FmHA supervised credit to families living on underdeveloped farms.

GUARANTEED LOANS

At the other end of the spectrum we find families more advanced in farming who have needs that could be served through FmHA loan guarantees.

In insured loans made directly by the agency, we are limited to a \$200,000 real estate loan in the farm ownership program and \$100,000 for an operating loan. However, we can guarantee as much as 90 percent of another lender's loan, up to loan limits of \$300,000 for farm ownership and \$200,000 for operation.

³ See table I attached.

This guarantee authority was provided in the agriculture credit legislation of August 1978 and has yet to come into extensive use by lenders in the private sector. It took some months to develop procedures and capacity within the agency to exercise the new provisions, which include better arrangements for secondary marketing of the guaranteed portion of loans. Lead lenders can market the guaranteed 90 percent of a loan as 100-percent Government-guaranteed investment paper.

Only about \$261½ million of regular farm ownership and operating credit was moved by the guarantee route in fiscal 1979. However, we intend to triple that showing, at least, in fiscal 1980. We have had excellent cooperation from the American Banker Association, which has issued an extensive guidebook through which banks may become familiar with the making and marketing of FmHA guaranteed loans. The Farm Credit Administration also is seeking, in legislation now before Congress, an authority for Federal Land Banks to lend more than 85 percent of appraised value of farm real estate under a Federal or State guarantee. This lessening of equity requirement for Land Bank loans would let these institutions serve more young farmers and others of modest resources under FmHA loan guarantees.

In various FmHA guaranteed farm loan programs, about 2,000 commercial banks and some Federal Land Banks and Production Credit Associations have now used the FmHA guarantee. As the private banking system becomes more accustomed to the process, and the interest situation settles back toward normal, we anticipate a larger use in agricultural credit of the FmHA guarantee that has worked so successfully in rural business credit.

EMPHASIS ON ENERGY SOLUTIONS

Farmers Home made its first loan this year for a farm-based alcohol plant, and a variety of other kinds of energy installations and energy-saving equipment are coming into use as means of offsetting the high cost of continued dependence on petroleum products or petroleum derivatives.

Gasohol, biogas, solar heaters, windmills, heat exchangers, heavier insulation of buildings, greenhouses, hydroponic and organic farming—all are elements in the farmer's quest for solutions to energy problems.

Reliable equipment in all these lines can be financed under FmHA farm credit programs. We hope in 1980 to help finance at least one farm alcohol plant for gasohol, and one methane gas production operation in each State from farm ownership, farm operating or soil and water loan funds.

Another FmHA contribution through research and development has produced a solar heat collector that can be built with \$2,500 worth of material and hauled by wagon around the farm for various drying and heating uses. This collector is patented by USDA. It has been demonstrated extensively and is in the final phases of testing. If it passes satisfactorily, the Department's intention is to make the plans available for reproduction by farmers or manufacturers beginning in 1980, and to make this collector eligible for FmHA financing as a new energy-efficient item of farm equipment.

PARTICIPATION AND AGRIBUSINESS LENDING

An alternative form of cooperation between FmHA and the private sector is participation lending, which has been pursued with good effect for the past several years. This is an arrangement whereby FmHA and other lenders each provide part of a farmer's total credit needs. The ratio of other lenders' service to FmHA borrowers dropped off, however, in fiscal 1979. Other lenders provided about 60 cents to go alongside every FmHA dollar loaned in the farm ownership and farm operating programs, as compared to 90 cents the previous year.

In Farmers Home's use of its business and industrial (B. & I.) loan guarantee as an aid to get agribusiness in the rural economy,⁴ questions have been raised whether B. & I. loans to custom feedlots encourage a form of competition to the independent farmer-producer of livestock.

FmHA has given B. & I. guarantees to six custom feedlot applicants for loans totaling \$4.35 million. These loans did not violate the rule against B. & I. loans for direct production of food and fiber. They were made to custom lots that fatten cattle on a contract per-head-price basis for the owners of the cattle. The lots profit on the service they provide, rather than from sale of the cattle. On balance, in our experience, this service works to the advantage of family-size farmers and ranchers by affording them some flexibility in marketing their cattle. Rather than being forced to sell animals as feeder calves, they can sell fat cattle via the use of custom feedlot services.

OTHER PROSPECTS FOR 1980

A question left over from last year's agenda of issues pending in Congress is whether the agricultural lending done by the Small Business Administration should be transferred to FmHA. Congress is still working on legislation to that effect.

Another concern is that of land use—the preservation of land to the purpose of farming. In housing and community development programs, we are giving great weight to protection of valuable farmland. We seek to avoid its diversion to other uses in projects assisted by FmHA loans and grants.

Next year may bring into wider discussion the question whether Government financing for elements of rural development should be consolidated into a new form of Rural Development Bank. This kind of institution would evolve to a large extent from the present wide range of credit services administered by FmHA.

As a closing word, may I emphasize that our administration of the resources over which we hold stewardship will continue to prioritize service to the areas of greatest need. We are working for better adjustment to FmHA programs to objectives defined by planning and development bodies in the States and their rural subdistricts and communities. We are putting into effect in 1980 a new type of annual operating plan for the FmHA organization in each State. These are well documented plans for addressing the major needs, developed in conjunction with State and sub-State development agencies. It goes almost without saying that in most of rural America, agriculture reigns as the bedrock enterprise, and a foremost concern of the Farmers Home Administration.

⁴ For a current status report on the B. & I. program, see attachment I.

TABLE 1.—VOLUME OF FmHA PROGRAMS

	Actual fiscal year 1979		Budget fiscal year 1980 amount
	Number	Amount	
Farmer programs (loans)	163,368	\$7,705,468,270	¹ \$2,406,600,000
Regular programs:			
Farm operating	(37,943)	(894,753,900)	(875,000,000)
Farm ownership	(12,568)	(763,164,770)	(870,000,000)
Soil and water	(2,500)	(51,479,340)	(53,100,000)
Recreation enterprise	(29)	(2,195,940)	(2,400,000)
Grazing associations	(5)	(2,074,300)	(4,800,000)
Irrigation and drainage associations	(5)	(637,000)	(7,400,000)
Indian land acquisition	(7)	(11,000,000)	(11,900,000)
Emergency programs:			
Economic emergency	(47,302)	(3,089,485,930)	(750,000,000)
Disaster emergency	(62,913)	(2,871,641,760)	(²)
Emergency livestock	(97)	(19,035,330)	(³)
Housing loans and grants (includes long-term obligations for rental assistance)	126,070	4,286,591,430	4,952,500,000
Community facility loans and grants	3,843	1,460,294,280	1,270,500,000
Business-industrial guaranteed loans	1,609	1,219,307,670	1,100,000,000
Total all programs (plus \$51,904,020 administered for other agencies)	294,890	14,671,661,650	¹ 9,729,600,000

¹ Plus disaster emergency loans.² As needed.³ Expired Sept. 30, 1979.

TABLE 11.—SHARES OF U.S. AGRICULTURAL DEBT OUTSTANDING—FROM FSCS ESTIMATES FOR JAN. 1, 1980

	Amount (billions)	Percent of total	Percent on Jan. 1, 1979
Real estate:			
Federal Land Banks	\$29.45	35.5	34.1
Life insurance companies	11.9	14.3	14.1
All operating banks	8.972	10.8	11.8
Farmers Home Administration	4.4	5.3	5.7
Individuals and all others	28.31	34.1	34.3
Total real estate	83.122		
Non-real estate:			
All operating banks	30.4	40.7	43.3
Production credit associations	17.57	23.5	23.0
Federal Intermediate Credit Banks	.650	.9	.8
Farmers Home Administration	.9	13.2	8.9
Individuals and others except CCC	11.72	15.7	16.0
CCC price support and storage loans	4.5	6.0	8.0
Total non-real estate without CCC	70.24		
Total non-real estate including CCC	74.74		

[ATTACHMENT 1]

ECONOMIC AND PROGRAM IMPACTS ON THE B. & I. PROGRAM
IN FISCAL YEAR 1980

1. Inflation

To date inflation has not had an adverse impact B. & I. loan volume. During fiscal year 1978 and 1979, while inflation was running double digit annual rates, B. & I. loan volume continued to grow both in dollars and numbers of loans guaranteed.

Indicators show that we are in a recession or will be soon. The demand for B. & I. loan guarantees in the event of a recession is uncertain. There will likely be less credit available on long terms for small firms and those embarking on new business projects. Certainly bankers will tighten credit requirements and shorten terms for speculative investments. However, the FmHA guarantee is an inducement for lenders to finance proposals with longer terms than they would handle without a guarantee.

Nationally, indications are that there will be strong steady growth in the business sector and the demand for B. & I. loan guarantees could be expected to grow proportionately. Price increases are expected to moderate within the next 10 years as inflation is brought under control. Consequently, inflation should not have an undue effect on B. & I. loan demand but could result in larger loans and cost overruns for construction projects.

Our experience during the recession of 1974, 1975, was that business borrowed short at high interest rates, using working capital to finance fixed assets and then came to FmHA for refinancing. The purpose of the B. & I. program is to expand the rural economy and create employment. We do not see refinancing as advancing that purpose, unless it can be clearly demonstrated that jobs will be saved.

2. Interest rates

With the prime rate at 15 percent in October 1979, it would seem logical to assume that private enterprise would restrict its borrowing activities. Nationally, it appears that some businesses are "panic" borrowing in the fear of rising inflation and climbing interest rates. At this time increased interest rates has not dampened the demand for B. & I. guaranteed loans. However, the consistent volume of B. & I. loan guarantee activity reflects, in part, the backlog of loans obligated but not closed before interest rates rose to their present heights. It can be expected that some guaranteed lenders will want to increase interest rates before the loans are closed. This may discourage applicants from proceeding to closing. On the other hand, if the lender is not permitted to increase the interest rate, it may well decline to make the loan. If interest rates charged to B. & I. applicants continue to increase, there is a strong possibility that B. & I. loan guarantee demands will decrease proportionately. One way to assist borrowers would be to put a lid on interest rates that lenders can charge on B. & I. guaranteed loans. While such action would benefit the borrower, it would interfere with the free money market and remove some of the incentive for lenders and investors to participate in the program.

3. Secondary markets

Secondary markets will play an increasingly important role in the inflationary, high interest period. More secondary market investments will be sought by lenders to satisfy the needs of their customers. Interest rates charged by lenders in this period will have an important effect on whether they are successful in selling B. & I. loans on the secondary markets.

4. "Tight money"

The Federal Reserve is attempting to restrict the money supply in an effort to control inflation. Member banks must increase the amount of reserves on deposit and pay a discount rate of 12 percent or more on loans from the Federal Reserve. The "tight money" policy is receiving wide support from bankers and businessmen and may have a dampening effect on B. & I. loan guarantee requests.

5. Proposed regulatory changes

(a) *Fee guidelines; commitment fees, lender fees, broker fees, etc.:*

Currently, loan-related fees are allowed if they are "reasonable and customary." How, "reasonable" has never been defined.

The impacted parties are borrowers, lenders, and investors.

An overall limitation on fees for services rendered on B. & I. loans could result in a higher interest rate to the borrower. The limitation on lenders' fees measured by an acceptable range of yields tied to the current GNMA securities should be enough to keep lenders involved.

The limitation on packager's fees calculated on a declining scale as a percentage of the principal amount of the loan should bring these fees in line with acceptable commercial practice.

Because investors do not benefit from the lender's extra profit extra points or higher interest rates they will not be impacted greatly by a change in lenders' fees or packagers' fees FmHA will define and publish fee guidelines and invite public comment before regulations are changed.

(b) *Redefining "local lender":*

The local lender is ordinarily required to be the lead lender on a B. & I. guaranteed loan. The definition of "local lender" is difficult to interpret. FmHA proposes to broaden lender eligibility by allowing more regional lenders to come into areas where lenders are small and cannot fund and service commercial loans adequately. Small lenders may also be restricted by legal lending limitations from participating in larger credits.

This new policy will require less FmHA personnel to monitor lender servicing because of the involvement of more competent lenders.

(c) *"Shared risk" with primary lender/bank:*

FmHA proposes that lead lenders share risks with FmHA by participating with their funds in each loan guarantee. At minimum, the lead lender would hold 5 percent of the loan out of the unguaranteed portion of the total loan.

This change will have a significant impact on the B. & I. program. Local lenders may be restrictive from extensive program participation because of limited capital. Most local lenders are small and may not be able to carry any of the unguaranteed portion of the loan. Such a change may shift a larger portion of the program to lenders with higher capitalization. The secondary market may be affected to the extent that it is involved in placing the unguaranteed portion of FmHA guarantees. The market could be affected by the lack of flexibility to sell all of the unguaranteed portion of the loan to risk investors looking for high yields.

(d) *Balanced B. & I. portfolios:*

A balanced portfolio is important to the administration of the B. & I. program. Therefore, FmHA will examine the B. & I. portfolio for concentrations of loan guarantees in certain sectors such as motels/hotels and health care facilities. FmHA does not intend to restrict any industry by regulation because that would be contrary to the intent of the program. Care will be exercised to take State and FmHA priorities into consideration.

(e) *Prescreening of loan requests in excess of \$5 million:*

There has been a tendency for the loan portfolio to grow in loan size. FmHA believes that rural development can best be accomplished through modest-level loans. Recent studies have shown that most of the growth in employment is in smaller companies. The Senate Appropriations Committee has called for a study of loan size to be completed

February 1, 1980. Prescreening of large loans is desirable from a policy standpoint but the procedure could add to the processing time. Final action on loan size limitations, if any, should become effective after the Senate study.

(f) *FmHA policy regarding participation of borrowers and holders in the guaranteed or unguaranteed portions of the loan:*

Such participations are discouraged because a conflict of interest is created on the part of the borrowers or holders. Any principals, those providing any guarantees, related companies, whether parent, subsidiaries or affiliates should be restricted from participation. We do not anticipate any objection from the lenders or the secondary market concerning this change.

6. *Proposed legislative changes*

The present law contains the ambiguous definition of "urbanizing" as an area with a standard density of 100 persons per square mile. This is difficult to administer and it is proposed to eliminate this definition of urbanizing to allow for more consistent management decisions and to permit a larger number of rural residents to benefit from the program.

To eliminate duplication of efforts by the Department of Labor and FmHA in reviewing applications for excess capacity and transfer of employment from one area to another, it is proposed to amend the consolidated act by clarifying the decision of the Secretary of Labor as final in determining the economic impact of the proposed rural industrialization assistance. It can be expected that there may be resistance to this change by the Department of Labor and labor unions.

7. *Alternate energy sources and energy conservation*

Lending for these purposes has been limited thus far but some alternate energy projects are eligible for B. & I. guaranteed loans. We can expect increased borrower interest as the need for conserving existing energy supplies rises and advances in developing new sources come about.

Certain gasohol projects are eligible for under the B. & I. program and several coal bed gasification projects are under review. Projects to develop traditional or fossil forms of fuel are also eligible. Our experience in reviewing applications for energy-type loans shows that often the technical feasibility of the project has not been established. These projects also tend to be undercapitalized and the economic feasibility is difficult to prove. There are problems in processing these applications because of the extremely technical nature of the projects and the difficulty in proving the feasibility of the loan.

To date, two gasohol projects have been guaranteed totaling \$5,122,000.

The Senate Agriculture Committee has approved gasohol legislation authorizing \$1.25 billion per year for farm and commercial projects to produce fuels from crops and wood products.

Half of the loans would be earmarked for small-scale projects. Wood energy projects would get one-third of the loans. Guaranteed loans would total \$1 billion, with the other \$250 million for direct loans.

The House Agriculture Committee has approved legislation similar in design, but with a total of \$800 million in authority (AgBanker 9-79—American Bankers Association).

FARM EQUIPMENT, FARM CHEMICAL, AND LABOR OUTLOOK 1980

(By Robert D. Reinsel, agricultural economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture*)

Farm production expenses increased about 16 percent in 1979 as the result of modest increases in quantities of inputs used and rather sharp price increases. A further increase of 11 percent is expected in 1980.

PESTICIDES

Pesticide supplies are expected to be readily available for all major uses in 1980. Prices, however, are likely to increase from 5 to 10 percent for herbicides and insecticides. For some fungicides, price increases may be as much as 15 to 20 percent.

The price increases for insecticides are largely the result of sharp increases in petroleum-based feedstocks prices, particularly for solvents and emulsifiers which experienced 30 to 50 percent increases in 1979.

Quantities of pesticides used in 1980 will likely be slightly higher than in 1979 as a result of increased crop acreage, increased use of multiple product treatments, and perhaps an increase in insect infestations from the unusually light year in 1979.

Pesticide regulations continue to play an important role in pest control decisions. The rebuttable presumption against reregistration (RPAR) process is continuing but is far behind schedule. Approximately 35 to 40 percent of farm insecticides are being reviewed. In addition, 40 to 50 percent of the fungicides are in the review process. Cancellation hearings are expected to begin soon for 2,4,5-T and silvex. Recent regulations are having major impacts on the cost of pesticide registration, slowing the introduction of new materials and limiting the use of many materials.

In the longer run, increasing research, development, and registration costs and greater restriction on uses of specific products will tend to reduce the range of products available for pest control and limit the competitive nature of the pesticide market.

FARM MACHINERY

Farm machinery prices for 1980 will likely increase at an average rate of 10 percent reflecting increases in the prices of primary production inputs. Wholesale prices for iron and steel used in farm machinery increased 10 percent from September 1979.

Hourly earnings of workers in farm machinery production rose 12 percent in the same period and further increases are expected in 1980.

*Material prepared by Theodore Eichers, Paul Andrienas, and Richard Rortvedt.

Thus, much of the basic cost increase is already built into the system and further raw material price increases are expected next year.

Demand for farm machinery is expected to remain at current levels into the first half of 1980. However, as farmers begin to be affected by increasing costs for other inputs during the planting season and by the higher cost of short term credit, machinery purchases are likely to be postponed.

If net farm incomes decline, as expected, due to the rapid increase in input cost and the modest rise expected in commodity prices, farm equipment sales could drop significantly in the second half of 1980.

FARM LABOR

Farm wage rates have increased steadily in the past decade and are expected to continue rising in 1980 at a rate of 7 to 8 percent. Supporting this increase is the 6.9-percent increase in the minimum wage, which will set the minimum wage rate at \$3.10 per hour up from \$2.90 per hour. Wage rates in areas affected by collective bargaining may rise more sharply than the average for all farmworkers.

Rising farm wage rates and nearly stable employment have caused the farm wage bill to double in the past decade, yet because of rapid increases in the prices of other inputs, wages represent a slightly smaller share of production cost than in the early seventies.

FERTILIZER

Average prices paid by farmers for fertilizer may be up 15 percent over year-earlier prices as a result of relatively strong demand and increased production costs. Price increases for anhydrous ammonia and urea are expected to be above the 15-percent average. Nitrogen solution price increases will be much less rapid. Potash and phosphate prices are expected to be near the 15-percent average for all materials.

Fertilizer prices and supplies, unlike most other inputs except energy, are strongly impacted by forces outside the United States and for nitrogen fertilizer by changes in oil and natural gas prices.

World demand for fertilizer has been quite strong due to generally strong demand for grains which has strengthened international grain prices. In North America, fertilizer use recovered to near record levels this spring following a decline in consumption in 1977-78.

International prices for fertilizers have increased significantly in 1979. Those prices have been affected by rising energy costs, but energy costs can only partially explain the increases. Consistently, strong world demand has allowed the passthrough of rising production costs. However, the extent of fertilizer price escalation likely will not approach the extremely high levels during the 1974-75 fertilizer price increases which followed the Arab oil embargo. Fertilizer price hikes are not expected to significantly reduce world fertilizer consumption in 1979-80. The impact of higher fertilizer prices upon fertilizer consumption in developing countries will be partially offset this year by existing reserve stocks and increased fertilizer assistance from donor countries.

It can be concluded that fertilizer prices have reached the bottom of a downward slide which began in 1975 and have now turned upward.

The new trend indicates a steady climb in fertilizer prices, although less precipitous than the increases which quadrupled some fertilizer prices from 1973 to 1974.

While dramatically increased energy costs following OPEC petroleum price increases served to catalyze both the 1974-75 fertilizer price boom and the current price escalation, in neither case do energy price increases fully explain fertilizer price jumps. In 1974-75, world fertilizer production capacity was slow to respond to expanding fertilizer demand resulting from concern about a world food crisis. In addition, price controls in the United States were lifted in 1973 and allowed domestic fertilizer prices to abruptly rise. Producers in the United States who had exported fertilizer during periods of low domestic prices were then attracted back to the domestic market. As a consequence, international supplies tightened and world prices also began to rise.

An important moderating factor affecting the current fertilizer outlook is the more comfortable production capacity situation compared with 1973 and 1974. Expansions in the industry have resulted in surplus supply capability worldwide for all three nutrients.

To some extent world surplus fertilizer supply capabilities and large inventories have kept fertilizer prices unusually low for the past 2 or 3 years and the current round of price increases probably reflect the industry's attempts to "catch up." However, since idle capacity is available, especially for nitrogen, higher prices should induce short term production increases which will prevent fertilizer prices from skyrocketing as they did in 1974-75 when such idle capacity did not exist.

Among fertilizers, nitrogen prices are most affected by rising energy costs due to the large amount of hydrocarbon feedstock and process fuel required in the ammonia manufacturing process. Most of the world's ammonia capacity is based on natural gas, but significant numbers of plants are based upon naphtha and fuel oil, both petroleum and derivatives. A few plants currently use coal as a feedstock although coal will become more important in the future.

Naphtha and fuel oil prices respond quickly and directly to increasing petroleum prices. Naphtha prices have risen proportionately more than any other petroleum product this year. European spot prices were up 74 percent from the end of January to the end of July 1979. Even contract prices for naphtha in Europe rose approximately 55 percent from first quarter 1979 levels to an estimated \$290 per metric ton during the third quarter. With naphtha selling at these prices, feedstock and fuel alone for naphtha-based plants would cost over \$250 per metric ton of ammonia. Energy analysts now believe that naphtha prices may stabilize near their current high levels.

While only 16 percent of the world's ammonia capacity is based upon naphtha and fuel oil, some regions and countries are disproportionately affected by rising naphtha and fuel oil costs. Europe and Asia are the most dependent upon these feedstocks.

In June 1979, the FAO/UNIDO/World Bank Fertilizer Working Group forecast that during the 1979-80 fertilizer year, world supply capability for fertilizer ammonia would exceed projected world

demand by 2.10 million metric tons of nitrogen (N). World naphtha-based fertilizer ammonia capacity totals 6.44 million metric tons of nitrogen in August 1979. If excessively high naphtha prices force the idling or closure of a large proportion of naphtha-based ammonia plants, world ammonia production may not keep up with the projected demand.

PHOSPHATE

The phosphate fertilizer industry is not as strongly affected by rising energy costs as the nitrogen industry because it is based upon the mining of a nonfuel mineral, phosphate rock. However, phosphate mining does require significant amounts of energy for strip mining, rock drying, processing of the rock (beneficiation), and transportation.

Furthermore, the phosphate industry is the world's largest consumer of sulfuric acid which is used in converting phosphate rock to phosphoric acid and upgraded phosphate products. Sulfur production and use is highly energy intensive.

Spot prices for solid sulfur have increased by 36 percent and 79 percent since January 1 in Western Europe and Canada, respectively. These increases are the result of tight world sulfur supplies during the first half of 1979. Among the causes of the sulfur shortage are:

Cessation of production in Iran following political upheaval.

Curtailed exports from Poland resulting from frozen, then flooded port facilities.

Curtailed Canadian exports due to snow closed railroad routes to Vancouver and a longshoreman's strike in Vancouver.

Lost Polish production due to curtailed natural gas imports from the U.S.S.R.

And, most recently damage to a railroad and bridge in Vancouver.

Phosphoric acid is the intermediate product from which upgraded phosphate fertilizers are made. The cost of sulfur required to manufacture a metric ton of phosphoric acid has increased from about \$38 to nearly \$85 in the past year (based upon f.o.b. Canadian solid sulfur spot prices in July 30, 1978, and July 31, 1979).

The phosphate situation has been exacerbated by a scarcity of available specialized vessels for carrying phosphoric acid. Together these short term factors have increased the competition for the remaining available phosphate supplies.

Since the United States is the world's largest phosphate fertilizer producer and exporter, its influence upon world phosphate prices is very strong. Exports of phosphate fertilizers from the United States during the 1978-79 fertilizer year ran an estimated 15 percent ahead of the previous year, accounting for about 40 percent of domestic production. Domestic consumption of U.S. phosphate also increased in 1978-79 by an estimated 9 to 10 percent.

Due to increased exports and recovery of domestic demand, U.S. inventories on July 30, 1979 for phosphoric acid, concentrated superphosphate and diammonium phosphate were, respectively 26 percent, 22 percent and 52 percent lower than 1 year earlier. Many phosphate exporters have committed virtually all of their available tonnage through the remainder of the year.

POTASH

The potash industry and situation are considerably less complicated than those of nitrogen and phosphate. One product, muriate of potash, dominates the world market. Very few countries are major potash producers/exporters and relatively few firms are involved. Potash mining and processing is less energy intensive than either nitrogen or phosphate. However, rising production costs, including energy costs have contributed to recent potash price increases.

Standard grade muriate of potash spot prices increased 36 percent and 22 percent in Western Europe and Canada respectively since January. Part of this increase is due to short term factors including frozen ports in East Germany and the Soviet Union last winter along with port construction in Russia and the longshoreman's strike in Vancouver. Persistent railcar shortages have exerted price pressure upon North American consumed potash. Canadian exports will also be curtailed because of damage to the railroad and bridge in Vancouver.

Strengthening demand resulted in a 7-percent increase in international potash trade in 1977-78. World demand for potash has also been very strong in 1978-79.

Recent forecasts indicate that growing demand could outstrip available supply by 1985 unless new capacity is developed. The possible closure of a mine with production problems in the United Kingdom might tighten supplies even sooner.

Due to the long lead time involved in developing new potash mines and processing facilities and rising production costs, growing world demand will continue to be met by rising potash prices. Potash prices will most likely rise steadily but more moderately than nitrogen or phosphate prices. In the longer term, new plants and expansions in Saskatchewan and New Brunswick, Israel, Jordan, and the U.S.S.R. should assure that adequate potash supplies remain available.

214 ENERGY INPUTS []

(By Weldon [Barton, Director, Office of Energy, Office of the Secretary, U.S. Department of Agriculture)

SUMMARY OUTLOOK

Long-term decisions on energy usage in agriculture should be based on the premise that fossil fuels will continue to diminish in supply and must be replaced with renewable energy sources. In 1980, the energy price and supply situation will be marked by global political considerations and rather ambiguous economic factors. Under those conditions, our prudent forecast is that supplies of petroleum fuels will remain tight and prices will continue to increase, with the extent of increase obscured by factors largely unpredictable at the present time.

With tight supplies expected and with energy representing an increasing percentage of total variable costs in agriculture, we can expect producers to seek additional hedges against supply and price instability. Unless an acute shortfall occurs during 1980, requiring a governmental rationing system, we might expect a continuation during 1980 of selective intervention by Government to assist in managing scarcities and spot shortages of gasoline, diesel, and other fuels with the minimum necessary enforcement of formal regulations.

I. PLACING U.S. ENERGY SUPPLIES IN GLOBAL PERSPECTIVE

In order to understand why we cannot forecast the U.S. supply and price situation for 1980 with any confidence (except that supplies will remain tight and prices will continue to increase), we need to place the U.S. petroleum energy situation in worldwide perspective.

The following aspects are important:

In 1978, world production of petroleum averaged about 59.9 million barrels per day, of which 43.1 million barrels (72 percent) was sold in world trade. Of this, the United States produced about 8.5 million barrels of petroleum per day and imported 7.9 million barrels per day; imports therefore were about 48 percent of total petroleum available to the United States.

The percentage of petroleum sales by oil-producing countries directly to individual importing countries, or to private oil handlers within those countries, at "spot" prices has increased substantially, compared to the percentage of sales made to the major oil companies under long-term contract. In 1974 when the International Energy Agency (IEA) emergency oil-sharing plan was formulated, major oil companies handled about 80 to 85 percent of the oil supplied to the 19-member IEA group of countries.

Currently, sales by Organization of Petroleum Exporting Countries (OPEC) directly to countries or handlers within the countries, rather than under contracts with the major oil companies, are estimated to total about 15 million barrels per day, or 50 percent of total OPEC exports. This has resulted in greater instability of the price of oil in world trade, and in reduced ability of the major oil companies informally to allocate supplies among importing countries.

The primary stocks of petroleum and refined oil products held by private suppliers in the United States, while they may be considered "adequate" for the particular season of the year, are not a useful hedge against supply and price instability for any several-months duration. In early 1979, for example, even though at the beginning of the reduction in U.S. imports due to the Iranian situation our privately held stocks of petroleum and product were substantially higher than at the time of the Arab embargo in 1973, those stocks did not forestall upward price pressures. They did not primarily because stock holders sought to maintain their inventory levels and to allocate projected import shortfalls in advance, rather than to draw down domestic stocks to cushion the impact of import reductions. Given the basic economic factors at work in such a situation, the same reaction might be expected to occur in a similar future import reduction situation.

The U.S. strategic petroleum reserve does not contain an adequate volume of readily recoverable stocks to serve as a hedge against foreign supply disruptions. The strategic petroleum reserve currently has 91.7 million barrels in storage, and no additional oil for the reserve is immediately on order. U.S. imports of oil during 1979 have averaged about 8.2 million barrels per day. At that rate, our strategic reserve would cover about 11 days total disruption of imports.

For the time being, therefore, there are essentially no built-in stabilizers of petroleum supplies and prices that would partially offset fluctuations in supply which are essentially uncontrollable (and largely unpredictable) from the perspective of the United States. Even absent a disruption of the type involving Iran in 1979, the tightness of supply available to the United States depends heavily upon decisions made by Saudi Arabia and other major exporting countries on their level of production and export. Furthermore, such decisions by major exporters can offset reductions in U.S. energy consumption due to economic recession or energy conservation.

The "bottom line" of the global liquid fuel situation is that the tightness of supplies available to the United States—and therefore to agricultural and other users in this country—is basically uncontrollable from our perspective until we reduce our dependency on foreign sources and build hedges against short-term disruptions through strategic reserve stocks or other effective mechanisms. Also, it seems prudent to anticipate that a tight supply situation will tend to prevail until these fundamental steps are well underway.

II. ENERGY SUPPLY SITUATION AND OUTLOOK: CONTINUED TIGHT SUPPLY

With respect to energy supply per se, 1979 has been marked by very tight supplies and the selective intervention by the Federal Govern-

ment in order to manage scarcities of gasoline, diesel, and other fuels with the minimum necessary formal regulations. In addition, heavy reliance was placed upon the allocation by individual States of set-aside volumes of diesel and gasoline, in order to afford a flexible response to changing priority requirements within specific States.

Petroleum fuels

Through the first 9 months of 1979, refined petroleum products were consumed at the rate of 18.5 million barrels per day. This is 1.3 percent less than was used during the same period in 1978. Gasoline demand was down 4 percent and distillate use was down 2.7 percent. Use of kerosene and heavy oils was up 10 to 12 percent. Domestic crude oil production at 8.5 million barrels per day declined 1.6 percent from the 8.7 million barrels produced for the same period last year.

Diesel fuel

Diesel fuel has rapidly supplanted gasoline as a power fuel used by farmers. Nearly all new tractors and combines are diesel powered. In 1979 an estimated 3 billion gallons of diesel fuel were used to power tractors, combines, and other farm machines and to operate irrigation pumps. Diesel is also used as fuel in smudge pots to protect tender fruit and vegetable crops from frost damage.

Middle distillate fuels, including diesel, have been in extremely tight supply. After the long, harsh winter of 1977-78, distillate stocks reached a low of 113 million barrels at the end of March. This was well below the normal stock range of 135 to 155 million barrels. Farm demand for the fuel heightened when cold, wet weather delayed farmers' spring fieldwork. A 416-million-gallon demand projected for May on the basis of the April farmers' intentions to plant survey, in effect, became an 800-million-gallon demand because of the compressed field work period. Fuel distributors supplying farmers were unable to obtain sufficient diesel fuel to meet these expanded needs.

The Carter administration invoked mandatory allocation regulations, in the form of special rule No. 9, to deal with this situation. The rule, which entitled agricultural production to full current energy requirements, was in effect from May 10 through June 25. Although some farmers experienced difficulty in obtaining fuel, the crops were planted with a minimum of overall disruption.

Gasoline

Farmers use about 3 billion gallons of gasoline for production purposes annually. It powers tractors, combines, trucks, and automobiles as well as irrigation pumps, chain saws, and small engines for many diverse uses. Since 1974 farmers have had top priority along with defense needs for gasoline under the mandatory petroleum allocation program of the Emergency Petroleum Allocation Act of 1973. On August 1, 1979, the administration modified the gasoline allocation regulations. Now farmers may receive 100 percent of their base period usage instead of 100 percent of current requirements. The base period used is the corresponding month within the period November 1977 through October 1978.

Generally, base period plans have been difficult to implement for agriculture because varying climatic conditions affect farm energy

requirements. The new rule provides some flexibility. If a farmer has more fuel than he needs in a particular month he may defer acceptance of a portion of his base entitlement until the next month. Or, if fuel in excess of his base entitlement is needed for a particular month, he may borrow against his next month's supply. A further adjustment is permitted if farmers' energy needs change as a result of USDA commodity programs. With these flexibilities, it is expected that farmers can obtain sufficient gasoline to meet their agricultural requirements. As farmers shift to diesel powered equipment, their demand for gasoline will be reduced.

Gasoline supplies are currently around 225 million barrels. This is below the normal stock range, but with the distillate target accomplished we can expect refiners to increase the proportion of gasoline-produced relative to distillates and other products.

LP gas

Liquefied petroleum gas (LPG), primarily propane, is used extensively by farmers in a wide variety of applications, ranging from powering tractors, combines, and irrigation pumps to operating poultry and livestock brooders and crop-drying facilities. About 1.5 billion gallons of LPG are used annually by farmers. About half of this amount is used for crop drying.

Worldwide, there has been a surplus of liquefied petroleum products, and the domestic supply had been in surplus prior to 1979. Currently, there is concern that propane stocks may not be adequate to meet farm needs, home heating and cooking requirements, and petrochemical industry demands. As of September 30, propane stocks at 73 million barrels, were 19 percent or 17 million barrels below the 1975-78 average.

Propane remains subject to both price and allocation regulations under the 1973 Emergency Petroleum Allocation Act. Under these regulations, farm producers are entitled to 100 percent of their current requirements.

Natural gas

The Federal Energy Regulatory Commission (FERC) projects adequate supplies of natural gas again this winter. Curtailments of natural gas service by the major interstate pipelines are not expected to result in any significant industrial or commercial dislocation or shutdown. The pipeline companies project available supplies at 6,096 billion cubic feet (bcf) for the 1979-80 winter season as compared to 5,960 bcf last year.¹ In addition to these supplies, deeper storage withdrawals and emergency gas supplies will be available to offset increased requirements in the event that extremely cold weather is experienced regionally.

The Natural Gas Policy Act of 1978 (NGPA) requires interstate pipelines to accord a No. 2 priority to essential agricultural uses—below homes, schools, hospitals, and small commercial uses, but above all other industrial uses. On May 16, 1979, the Secretary of

¹ The FERC has lowered estimates made last year to account for double counting in earlier estimating procedures.

Agriculture issued a rule certifying essential agricultural uses of natural gas, pursuant to section 401 of the NGPA. Included in this certification are on-farm uses, food processing and warehousing uses, as well as process and feedstock uses for the manufacture of fertilizers and other agricultural chemicals.

For farmers, this means that noncurtailment protection will be provided for supplies of natural gas used for irrigation, crop drying, and livestock brooding. In addition, the continued supply of such vital agricultural inputs as fertilizers and pesticides will be more secure. Although curtailments this year are expected to be insignificant, the additional protection which agricultural users enjoy may be vitally important in insuring food and fiber production in years to come.

Electricity

The Department of Energy reports that electrical generating capacity should be adequate to meet peak power demands in 1980. As of July 31 of this year, U.S. generating capacity totaled nearly 592,000 megawatts. Peak power demand this winter is projected at just under 395,000 megawatts, increasing to 448,000 megawatts in the summer of 1980, and decreasing to 416,000 megawatts in the winter 1980-81. Thus, provided there is no sudden and unforeseen surge in electricity demand or major power outages, electricity users should not face any supply problems in the coming year.

Electricity prices in 1980 are expected to be about 8 percent higher than in 1979. In 1979 the average price paid by farmers was just over 4 cents per kilowatt-hour.

III. PETROLEUM PRICES CONTINUE UPWARD CLIMB

Petroleum price increases in agriculture have far exceeded the increases initially forecasted last year at this time for 1979. In the year from September 1978 to September 1979, increases of 49 percent for gasoline and 73 percent for diesel have been reported by farmers. In the 6-year period since the Arab oil embargo, prices paid by farmers have increased 270 percent for gasoline, 380 percent for diesel, and 244 percent for LP gas.

OPEC increases in crude oil prices, along with pricing changes allowed by the Department of Energy, including the decontrol of domestic crude oil prices which began in July, and other factors have resulted in increased prices paid by farmers for gasoline from 83.1 cents per gallon in June to 90.5 cents in September, and for diesel from 72.2 cents per gallon to 81 cents per gallon during the same 3-month period.

Actions currently underway make it relatively certain that substantial price increases for petroleum fuels will occur in 1980. Crude oil price increases for the fourth quarter of 1979 have been announced by Mexico, Kuwait, Iran, Libya, and other producers. The Organization of Petroleum Exporting Countries will meet in December to decide on petroleum price increases, and an OPEC price increase of perhaps \$2 to \$5 a barrel—presently \$18 to \$23.50 per 42-gallon barrel—is expected.

Particularly in view of the growing percentage of world oil supplies which is marketed outside of long-term contracts on a spot basis, the

world petroleum price situation is increasingly unstable and unpredictable. Given the pricing actions already underway, petroleum-based fuel prices paid by farmers in 1980 are likely to increase at least 25 percent compared to end-of-1979 price levels.

Assuming further substantial increases in fuel prices in 1980, fuel costs will continue to increase as a percentage of total variable farm costs. Direct energy costs as a percentage of variable production costs increased during 1975-79 from 6.3 percent to 10.6 percent for corn, from 10.4 percent to 16.5 percent for wheat, and from 5.9 percent to 9 percent for cotton. In some regions and sectors of agriculture—for instance, where deep-well irrigation is required—direct energy costs make up relatively larger percentages of total variable costs.

Despite the current increase in energy costs relative to other farm variable costs, energy inputs continue to represent a small proportion of total costs for raw agricultural products. When all costs are considered, a 10-percent increase in energy cost raises total production costs by an estimated 0.6 percent. Agricultural production is much less energy intensive than manufacturing enterprises such as aluminum, steel mills, petroleum refining, paper mills, and chemicals.

Effect of rising farm energy costs on consumer food prices

If farmers purchase the same amounts of petroleum fuels and electricity as in 1979, they may be paying \$2.5 billion more for their energy input in 1980 compared with 1979. This assumes that petroleum prices rise 25 percent and electricity rates increase 8 percent. Since agricultural producers are price-takers in the short term, the immediate impact of such increases will be a \$2.5 billion reduction in net farm income.

Over time, farmers adjust their operations to account for rising energy input costs. The shift to more energy-efficient diesel powered equipment will continue, and farmers will institute more stringent energy conservation practices. Yet, in the long run higher energy costs will be translated into higher consumer food prices. Ultimately, most of the \$2.5 billion additional fuel cost would be passed to consumers, and would represent roughly a 1 percent increase in retail food prices.

IV. PRODUCER HEDGES AGAINST ENERGY SUPPLY SHORTAGES

There are a number of mechanisms available through which agricultural producers, acting individually or cooperatively, can partially hedge themselves against fuel supply disruptions. These include:

Production and distribution of fuel to producers through producer-owned cooperatives and cooperative associations. Currently, approximately 37 percent of agricultural petroleum requirements are supplied by cooperatives, which give priority to agricultural users in their distribution of fuel.

On-farm storage of fuels. As of 1974, a survey of diesel storage capacity on U.S. farms with annual sales over \$2,500 reported a total of 246.4 million gallons of on-farm storage capacity with an average volume of 658 gallons per farm. A total of 176,097 farms reported storage capacity of 500 gallons or more. Storage data from the 1978 Census of Agriculture will be released by States

beginning next month, which will indicate updated on-farm storage capacity for diesel, gasoline, and other storable fuels. Substantial increases in on-farm storage have occurred recently. Although on-farm storage cannot protect against prolonged shortages of fuel, it can help to assure ready availability of fuel for surges of agricultural activity during planting, harvesting, and other peak periods.

Production of fuel on farms or by farm cooperatives from agricultural products or residues. Although not yet statistically significant as a fuel source, an increasing number of farmers are producing methane gas or alcohol fuels either on their individual farms or on a cooperative basis, so that the fuel is directly available for on-farm use. As of October 19, 1979, the Treasury Department had received 3,498 experimental permit applications and approved 926 of these for the construction and operation of small-scale distilleries for fuel alcohol production. Although no precise data are available as of this date on the specific nature of these projects and the extent of completed construction, many of the experimental permits involve groups of commercial farmers intending to operate a plant on a cooperative basis rather than a strictly individual farm location and operation.

Further attention to these types of hedges against fuel disruptions by individual agricultural producers, or producers acting through cooperatives, can be expected in 1980. Although it is too early to determine the extent and timing of the movement to produce alcohol fuels for on-farm usage, developments in 1980 should provide a better barometer of that situation.

V. GOVERNMENT SUPPLY MANAGEMENT PROGRAMS AND SAFEGUARDS

In addition to agricultural user hedges against supply disruptions, Government management and allocation measures will continue to place high priority on fuels for agricultural production. It must be recognized that agricultural production involves a biological process which is timed by uncontrollable weather conditions. Temporary shortages of essential fuels can create shortages of food through lost production and spoilage. Therefore, priority measures designed to provide dependable fuel supplies for essential agricultural uses are required in the national interest.

There are several mechanisms in place which help to assure adequate energy supplies for farmers. There are State set-aside accounts for both gasoline and diesel fuel, which authorize 4 percent of diesel and 5 percent of gasoline received each month to be disbursed at the Governor's direction to alleviate hardships. Farmers are expected to apply for set-aside fuel if their regular supply is not adequate. Agricultural uses of gasoline currently receive priority of 100 percent of base period use under the Emergency Petroleum Allocation Act, in the event of a serious shortfall. Diesel allocation measures are maintained on a standby basis, to be invoked if conditions warrant. Liquid propane gas use by farmers is given priority under the Emergency Petroleum Allocation Act at 100 percent of current requirements. Agricultural uses of natural gas are afforded protection from curtailments by interstate pipelines, as provided in the Natural Gas Policy Act.

In addition to statutory provisions for assuring energy supplies for farmers, an interagency distillate management group (DMG) composed of USDA, DOE, and DOT officials has been instituted to monitor the distillate supply situation. If shortages develop the DMG will work with distillate suppliers to move products from surplus to deficit areas. The DMG is also in a position to recommend implementation of regulations, such as special rule No. 9, in the event of a special problem situation.

The USDA conducts weekly surveys of farm petroleum supplies. Local farmers report on the diesel fuel, gasoline, and LP gas supplies along with crop conditions and status of operations by crop reporting district. This weekly fuel update serves as a timely barometer of fuel availability and aids in pinpointing potential regional shortages.

In addition to monitoring the fuel situation, the USDA, through local ASCS offices, directly assists farmers in obtaining fuel by seeking additional supplies for farmers who are short, providing necessary forms and instructions, contacting State and regional energy offices, and in some States loaning the State energy offices staff to help handle the caseload of farmer requests for fuel from set-aside accounts. While the USDA has no authority to dispense fuel, farmers in need of petroleum may obtain help at their county ASCS office.

TABLE 1.—AVERAGE PRICE PAID BY FARMERS FOR FUEL ¹

[Dollars per gallon]

Year	Unleaded gasoline ²	Regular gasoline ³	Diesel fuel ³	LP gas
1973	0.379	0.331	0.213	0.169
1974	.538	.447	.364	.302
1975	⁵ .585	⁵ .535	⁵ .407	.304
1976	⁵ .590	⁵ .546	⁵ .415	.331
1977	.618	.578	.457	.389
1978	.668	.612	.467	.505
1979	.998	.905	.810	.413

¹ Sept. 15 of each year as reported in Agricultural Prices, Annual Summary, 1978 and in Agricultural Prices, Sept. 28, 1979, Crop Reporting Board, ESCS, U.S. Department of Agriculture.

² Purchased at service stations.

³ Bulk delivery to farm.

⁴ Prior to 1977, based on an annual survey made in July and August, reporting data for most recent bill, usually purchased during April, May, and June.

⁵ Oct. 15 for 1975 and 1976. Prices were reported quarterly in those years.

TABLE 2.—AVERAGE FUEL COST PER ACRE AND VARIABLE COST PER ACRE, 1975-79

Year and crop	Fuel cost per acre	Total variable cost per acre	Fuel as a share of variable cost (percent)
Corn:			
1975	\$5.72	\$91.21	6.3
1976	6.00	86.39	7.0
1977	7.89	96.41	8.2
1978	8.41	98.27	8.6
1979	11.10	104.80	10.6
Wheat:			
1975	4.72	39.50	10.4
1976	4.55	36.20	12.6
1977	4.80	37.24	12.8
1978	5.19	37.64	13.8
1979	6.85	41.35	16.5
Cotton:			
1975	8.43	143.99	5.9
1976	8.98	152.17	5.9
1977	11.45	168.21	6.8
1978	11.98	162.54	7.3
1979	15.81	175.61	9.0

LAND VALUES, FARM INCOME, AND GOVERNMENT POLICY

(By Michael Boehlje, Department of Economics, Iowa State University)

No topic commands more interest in rural communities than current and future land values. Consistent increases in values have led some to extrapolate recent trends and predict continued rapid rises in land prices in the future, while others ask when land prices will peak and begin to decline. Regardless of whether their viewpoint is tinged by pessimism or optimism, most would argue that even at current prices, land will not "pay its own way"—the net income is insufficient to make principal and interest payments under typical loan terms.

The following discussion will not predict land values in the future; a better understanding of the determinants of supply and demand is needed to provide such predictions. Instead, we will briefly review recent trends in values, the economic rationale for valuing an asset such as land using the capital asset pricing model, and the effect of various income and expense projections on land values. The implications of recent analyses of the historical relationship between land values and aggregate net farm income in the United States will be reviewed. Finally, the impact of Government policy, particularly tax and price support policy, on land values will be discussed.

HISTORICAL TRENDS

Land values in the United States have consistently increased during the last two decades. Since 1970, land values have increased 200 percent nationally; in parts of the Midwest, land values have increased more rapidly than the national average as noted in figure 1.¹ The Iowa land value survey shows an approximate fourfold increase in average land values from 1969 to 1978.²

As to recent trends, USDA reported a 14-percent increase in land values from February 1978 to February 1979, an increase from the 9-percent rate reported for the previous year.³ The Chicago Federal Reserve Bank quarterly survey reported a 3-percent rise in land values in the seventh district (Iowa, and parts of Wisconsin, Michigan, Illinois and Indiana) for the second quarter of 1979 and a 13-percent rise for the year ending in June 1979.⁴

¹ Schluter, Gerald and John Jones, "Farm Real Estate Market Developments," CD-84, ESCS, USDA, August 1979.

² Harris, Duane, Tim Lord and John Weirich, "1978 Iowa Land Value Survey," FM-1762, Cooperation Extension Service, Iowa State University, Ames, March 1979.

³ Schluter and Jones, op. cit., p. 3.

⁴ Benjamin, Gary, "Agricultural Letter," No. 1504, Federal Reserve Bank of Chicago, July 27, 1979.

Percent Increase in Average Value of Farm Real Estate per Acre
March 1970—February 1979

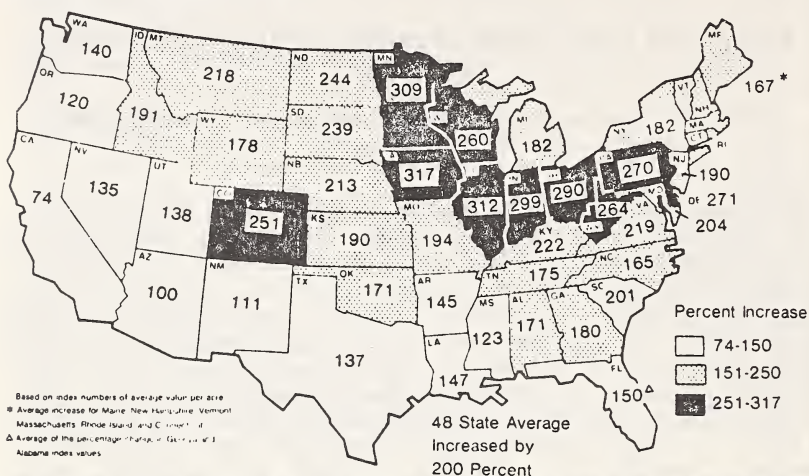


FIGURE 1.—Source: Schluter, Gerald, and John Jones, "Farm Real Estate Market Development," CD-84, ESCS, USDA, August 1979.

Most analysts predict continued strength in land values during the remainder of 1979 and 1980 because of favorable farm earnings, continued pressures for farm enlargement, and investor (both farm and nonfarm) interest in acquiring real property as a hedge against inflation. Although recent events in the money markets are expected to result in higher rates of interest on farm mortgages, mortgage funds and long-term financing through installment contracts appear to still be readily available, and the higher rates are not expected to have a significant depressing effect on the farm real estate market, particularly as long as real rates of interest are negative or unusually low. Early USDA estimates suggest an increase in land value in 1979-80 similar to the 14-percent increase observed for 1978-79. Recent activity in the market in the Midwest would suggest a higher rate of increase than occurred last year.

ASSET VALUATION

An investment analyst or an appraiser would argue that the value of an asset is based on the income stream generated by that asset discounted or adjusted by the time value of money to reflect the fact that income generated now has a higher present value than income generated in the future. This basic valuation concept can be summarized for an asset with a perpetual life (such as land) in the simple income capitalization formula:

$$1) V = \frac{R}{d}$$

where: V =value of the asset, R =its expected annual net return, and d =the capitalization rate reflecting the risk adjusted opportunity cost on funds (the time value of money).

A key issue in using this approach to valuation is the choice of a discount rate. The concepts utilized in the capital asset pricing model for an asset with a growing return are useful here.⁵ In essence, these concepts indicate that if the income stream for an asset is growing over time, the rate at which the current level of income is to be capitalized is equal to the discount rate minus the rate of growth in return. Thus, for example, if an asset has an annual return that is growing at 5 percent annually and the appropriate discount rate for investors in the market is 12 percent, the current annual income of that asset should be capitalized at 7 percent. As Melichar notes, "the discount rate determines the total rate of return, and the growth rate determines how that total return is divided between a capital gain and a current return."⁶

The relevance of these concepts to the rural land market have been discussed by Melichar.⁷ His analysis suggests that contrary to the popularly held belief that land values are not related to net farm income, with proper adjustments in the net income calculations (elimination of the return to management and labor) to obtain a residual return to land, and through appropriate consideration of the growth in return to production assets, the capital asset pricing model explains rather well the relationship between income and land values in agriculture. Specifically, Melichar calculated that the growth rate of current return to production assets in agriculture has averaged 5 percent during the period 1972 through 1978. During this same period, his calculations show that the average annual rate of current return to production assets averaged 5.4 percent. According to the capital asset pricing model, such rates would suggest a total return of approximately 10.4 percent on real property during this period.

Consequently, when the theoretically accepted capital asset pricing model for an asset with a growing income stream is applied to land, the historical relationship between land values, current income, and the growth in income suggests that other phenomena such as inflationary expectations, nonfarm demand, and even irrationally low rates of return are not essential to explain current land values. As Melichar suggests, "it thus appears that both recent real capital gains and those of 1954-67 are, in a sense, fully explained by the growth exhibited by the current returns to assets."⁸ Furthermore, it is not irrational for farmers to accept relatively low rates of current return if they are projecting historical trends in the growth of the income stream for real estate assets.

The numerical results of table 1 illustrate the application of these concepts to the Midwest land market. The calculations assume a constant net return stream based on \$2.40 per bushel corn and 110 bushel per acre yield minus expected 1979 total production costs excluding the land charge.⁹ Note the response of land values to different capitaliza-

⁵ Van Horne, James, *Financial Management and Policy*, 4th ed., Prentice-Hall, Englewood Cliffs, New Jersey, 1979, p. 22.

⁶ Melichar, Emanuel, "Capital Gains Versus Current Income in the Farming Sector," Paper presented at the joint meeting of the American Agricultural Economics Association and Western Agricultural Economics Association, Pullman, Washington, Aug. 1, 1979, p. 30.

⁷ Ibid.

⁸ Ibid., p. 32.

⁹ Stoneberg, E. G., William Edwards, and Harvey Thompson, "Estimated Costs of Crop Production in Central Iowa—1979," FM 1712, February 1979.

tion rates. Table 1 also illustrates the implications of different price expectations for corn on land values assuming a constant capitalization rate of 5 percent. In addition, the data indicate the land values that would be obtained assuming that costs are defined as including only variable costs, variable costs plus labor and overhead, and total non-land costs. Including only variable costs is the approach frequently used to estimate costs and returns to land for those with excess machine capacity buying add-on units. The point to note is that a combination of a low capitalization rate and somewhat optimistic (but certainly not unrealistic) price and yield expectations results in a land value that is not unlike some of prices currently being paid for real estate.

TABLE 1.—LAND VALUES FOR VARIOUS CORN PRICES, COSTS AND CAPITALIZATION RATES

Alternative capitalization rates:						
Corn price (dollar).....	2.40	2.40	2.40	2.40	2.40	2.40
Yield per acre (bushel).....	110	110	110	110	110	110
Gross return (dollar).....	264	264	264	264	264	264
Costs per acre (dollar).....	165	165	165	165	165	165
Net per acre (dollar).....	99	99	99	99	99	99
Minimum acceptable rate of return (percent).....	10	10	10	10	10	10
Rate of growth in income (percent).....	6	5	4	2	1	0
Capitalization rate (percent).....	4	5	6	8	9	10
Value (dollar).....	2,475	1,980	1,650	1,238	1,100	990
Alternative corn prices:						
Corn price (dollar).....	2.00	2.25	2.50	2.75		3.00
Yield per acre (bushel).....	110	110	110	110		110
Gross return (dollar).....	230	248	275	303		330
Costs per acre (dollar).....	165	165	165	165		165
Net per acre (dollar).....	55	83	110	138		165
Value (5 percent) ¹ (dollar).....	1,100	1,660	2,200	2,760		3,300
Alternative costs:						
Corn price (dollar).....	2.40	2.40	2.40			
Yield per acre (bushel).....	110	110	110			
Gross return (dollar).....	264	264	264			
Costs per acre (dollar).....	² 165	³ 121	⁴ 103			
Net per acre (dollar).....	99	143	161			
Value (5 percent) ¹ (bushel).....	1,980	2,860	3,220			
Alternative costs and capitalization rates:						
Corn price (dollar).....	2.50	2.50	2.50	2.50		
Yield per acre (bushel).....	115	115	115	115		
Gross return (dollar).....	288	288	288	288		
Costs per acre (dollar).....	³ 121	⁴ 103	³ 121	⁴ 103		
Net per acre (dollar).....	167	185	167	185		
Capitalization rate ⁵ (percent).....	5	5	4	4		
Value (dollar).....	3,340	3,700	4,175	4,625		

¹ Assumes a minimum acceptable rate of return of 10 percent, a rate of growth in income of 5 percent and thus a capitalization rate of 5 percent.

² Total costs excluding a land charge.

³ Total variable costs plus labor and overhead.

⁴ Total variable costs.

⁵ Assumes a minimum acceptable rate of return of 10 percent and a rate of growth in income of 5 percent for the 1st 2 columns and 6 percent for the 3d and 4th columns.

POLICY IMPACTS

Public policy choices have significant implications for the current return and capital gains on land. The impact of two dimensions of Government policy, price support programs and taxation policies, on land values and return will be briefly reviewed here.

Price support programs

The impact of Government price and income support programs on land values has been well documented.¹⁰ Recent research completed at

¹⁰ Harris, Duane G. "Inflation-Indexed Price Supports and Land Values." Reprinted from Amer. J. of Agr. Econ., vol. 59, No. 3, August 1977; Sharples, Jerry A. and Ronald Krenz, "Cost of Production: A Replacement for Parity?" Agricultural Food Policy Review, Washington, D.C.: Economic Research Service, USDA, ERS, AFPR-1, January 1977, pp. 62-68; Tweeten, Luther G., "Foundations of Farm Policy." Lincoln: Univ. of Nebraska Press, 1970.

Iowa State University has analyzed the financial linkages and the cash flow implications of Government support price programs as well as their impact on land values.¹¹

The specific purpose of the Iowa State research was to evaluate proposals to index Government support prices based on the cost-of-production. The results indicated (as expected) that with current price expectations and conservative inflation rates, the cost-of-production indexed support price mechanism could increase land prices dramatically within a short period of time. This increase occurs because of both the increased net income and the reduced risk and thus capitalization rate as the cost-of-production indexed support price places an increasingly higher floor under commodity prices. For example, land prices were driven upward by this support price mechanism from the initial value of \$1,770 per acre to \$7,000–\$8,000 per acre within 15 years, depending upon the price support parameters and the size of the firm (and consequently economies of size) used in the analysis.

However, the distributional impacts of such programs are of most significance. Although all current landowners receive the benefit of the capital gain that results from higher priced land, the larger, high equity operator is the only one financially able to pay the higher price for additional land. Thus, the Government support price program enables the larger, higher equity farm to expand more rapidly than the smaller, highly leveraged unit in terms of the land base (table 2). In essence, the Government support price program improves the guaranteed cash flow of the larger compared to the smaller unit, and this combined with the lower debt servicing requirement and larger amount of uncommitted cash from current landholdings enables the larger farmer to expand his land base more rapidly, pay a higher price for the land, and still enjoy a higher level of consumption and family living. So the great majority of the benefits of such a cost-of-production indexed support price program go to the larger producers.

TABLE 2.—INCOME, ASSETS, AND DEBT STATEMENT BY FARM SITUATION AND YEAR OF SIMULATION

Year	Income less taxes	Family consumption	Total land value	Acres in firm	Total assests	Total debt	Total equity	Annual growth rate in equity	Debt to asset ratio
Farm A:									
1.....	\$8,439	\$6,330	\$294,946	160	\$350,926	\$233,184	\$177,742	15.62	0.6645
5.....	9,895	7,421	283,970	160	361,890	226,097	135,793	5.98	.6248
10.....	13,787	10,340	497,285	160	613,770	217,541	396,229	13.70	.3544
15.....	33,147	24,860	1,253,527	160	1,425,158	209,308	1,225,850	16.66	.1458
Farm B:									
1.....	10,504	7,878	589,891	320	701,403	332,575	368,828	9.11	.4742
5.....	12,84	9,640	567,940	320	712,655	316,574	396,081	3.25	.4442
10.....	13,266	9,949	1,608,337	517	1,746,975	589,560	1,157,415	12.35	.3375
15.....	65,766	49,324	4,415,541	564	4,655,336	680,410	3,974,927	16.46	.1462
Farm C:									
1.....	40,698	30,524	1,179,783	640	1,402,687	394,742	1,007,945	6.98	.2814
5.....	43,024	32,268	1,683,490	949	1,863,937	762,961	1,100,976	3.16	.4093
10.....	64,674	48,505	3,585,376	1,154	3,827,919	956,464	2,871,454	11.17	.2499
15.....	170,954	128,215	10,296,190	1,314	10,643,179	1,411,657	9,231,521	15.23	.1326

Source: Boehlje, Michael and Steven Griffin, "Financial Impacts of Government Support Price Programs," American Journal of Agricultural Economics, vol. 61, No. 2, May 1979, pp. 285–296.

¹¹ Boehlje, Michael and Steven Griffin, "Financial Impacts of Government Support Price Programs," Amer. J. of Agr. Econ., vol. 61, No. 2, May 1979, pp. 285–296.

Tax policies

Various changes in tax laws have been implemented in recent years, and the implications for capital gains in agricultural assets are now becoming apparent. For example, the 1976 Tax Reform Act included two major provisions that will influence the income and estate tax burden associated with rural real estate. The first provision calls for the valuation of land, for estate tax purposes only, based on its income generating capacity rather than market value.¹² If certain qualifications are met, land will be valued based on the value of cash rent minus property taxes capitalized by the Federal land bank interest rate on new loans. Five year historical averages are to be used in this capitalization procedure. Recent analyses in Iowa and other Midwest States indicate that such a valuation procedure will reduce the value of cropland for estate taxation purposes by 50-60 percent.

The special use value legislation is written to limit this procedure only to bona fide farmers, but such restrictions will not completely eliminate the potential impact of this special tax treatment on the value of land. Farmers who can qualify additional purchases of real property for special use valuation will be willing to offer a higher price for real estate than other producers who will not qualify for the privilege, or who will be unable to take advantage of it until many years in the future. Consequently, the bid price for farm real estate would be expected to rise in the amount of the net present value of such tax benefits. Illustrative per acre benefits for different size estates are summarized in table 3.

TABLE 3.—VALUE OF BENEFITS FROM "USE" VALUATION PER ACRE OF LAND

New worth -----	Benefits per acre	Present value of benefits (8 percent) assuming death in—			
		5 yr	10 yr	15 yr	20 yr
\$250,000-----	\$200	\$136	\$93	\$63	\$43
\$500,000-----	349	238	162	110	75
\$1,000,000-----	382	260	177	120	82
\$1,500,000-----	303	206	140	96	65
\$2,000,000-----	247	168	114	78	53
\$2,500,000-----	208	142	96	66	45

Sources: Michael D. Boehlje, and Neil E. Harl, "Comments on Special Farm Use Valuation Under Section 2032A of the Code," Tax Notes, vol. IX, No. 4, July 23, 1979, pp. 107-113.

Because of the predeath requirement that qualified property must be used for farming or other closely held business purposes for five of eight years preceding death, one could presumably not obtain the special use valuation benefits of a current purchase for at least a minimum of 5 years. If a purchase of qualified real property is made with expectations of death in 5 years, the present value of the use valuation benefits total \$238 per acre for the \$500,000 estate (table 3). With the \$1 million estate, the present value of the benefits for a death in 5 years total \$260 per acre. As the expected life increases, and thus more years elapse between the purchase of the property and the date of death, the present value of the "use" valuation benefit declines. The benefits total \$40 to \$80 per acre if death is expected to occur 20 years following the purchase.

¹² I.R.C. sec. 2032A.

These figures indicate the per acre price premium that could be paid for real property that would qualify for "use" valuation. For a farmer with a life expectation of 5 years, the price premium of table 3 amounts to as much as 12 percent of the fair market value of the land use in the analysis. Thus, it could be expected that with increasing age, farmers would be encouraged to move toward a greater investment in land and less investment in nonland assets. Those with a longer life expectancy would pay a smaller premium for the benefits of "use" valuation as indicated in table 3. Thus, the "use" valuation legislation could enable older farmers to outbid younger farmers for a particular parcel of land based strictly on the value of the tax benefits each would receive. In general, the bid price for farm real estate would be expected to rise in the amount of the next present value of such tax benefits. This can only result in an increased divergence between the value of the land and its cash income generating capacity. If nonfarm investors are also able to qualify for special use valuation treatment of land in their estates, additional upward pressure on land values would be expected.

A second set of regulations that may have an impact on land values and capital gains in real estate are the regulations on carryover basis.¹³ The provisions of the 1976 Tax Reform Act require that property received by beneficiaries at a decedent's death will not be given a new income tax basis at that time. Instead, the recipient of the property will take a "carryover" basis—the income tax basis the property had in the decedent's estate while he owned it. At the time of a subsequent sale, tax will be due on the amount of the gain in the property as calculated by the market value of the property at the time of the sale minus the basis of the property adjusted for the gain that has accrued prior to December 31, 1976.¹⁴ These rules have been moratoriumed until January 1, 1980, and legislation to eliminate the carryover basis rules is pending.¹⁵

In essence, the new carryover basis rules would result in the accumulation of additional gain in property such as real estate that is expected to appreciate in value over time, and this gain will be taxed at a subsequent sale. If real estate continues to increase in value, a substantial gain and thus tax liability will also accrue so that recipients of property transferred at death may be reluctant to sell because of the large tax burden. This "locked-in" effect may result in reduced offerings of real estate on the market and more rental arrangements. With reduced offerings, values for property on the market may be bid up even further, and certainly different types of credit demands will exist to finance rental arrangements rather than real estate purchases. A tax on gain at death would not have this same effect since the tax would be paid before the heirs receive the property.

One might anticipate that a combination of the "carryover basis" and "use valuation" rule could sufficiently discourage current landowners from transferring real property to nonfamily members so that a rather exclusive class of rural land holders would develop over the years. The political and social implications of such a "landed gentry" are beyond the scope of this discussion, but such a land tenure system may not be in the best interests of the "family farm."

¹³ I.R.C. sec. 1023.

¹⁴ Other adjustments are also allowed, see I.R.C. sec. 1023.

¹⁵ Amendment to the Crude Oil Tax Act, H.R. 3919, October 1979.

The Revenue Act of 1978, which increased the amount of net long-term capital gain that can be excluded from gross income from 50 percent to 60 percent, also will have an impact on land values and capital gains in agriculture.¹⁶ In essence, this change reduces the tax obligation upon the sale of a qualified capital asset by 10 percent, thus increasing the after-tax return from such assets. Such a change in the tax regulations could again encourage buyers to pay more for qualified capital assets, particularly land, thus resulting in higher prices without an increase in the annual cash flow.

CONCLUSIONS

Little evidence is available to doubt that recent trends in land values will continue in the near future. Furthermore, recently completed analyses suggest that historical increases in land values in the United States are well explained (using accepted income capitalization concepts) by net farm income (properly adjusted) and the growth in net farm income. Thus, other phenomena such as inflationary expectations, nonfarm demand and irrational investment behavior are not essential to explain current land values.

Government price and income support policies will influence land values through the impact of such programs on: (1) the current income stream to be capitalized (higher support prices, if effective, result in higher income), (2) the growth in income over time which will effect the appropriate capitalization rate (indexed supports result in higher growth rates and lower capitalization rate); and (3) the risk of the net income stream which will further effect the capitalization rate (higher supports truncate the lower tail of the price distribution, thus decreasing risk and the capitalization rate). Government tax policy also will influence land values; however, such changes in tax law as special use valuation of farmland and the reduction of capital gains tax obligations will result in higher prices without an increase in the annual cash flow—making debt servicing even more difficult.

¹⁶ Revenue Act of 1978.

SPECIAL SESSIONS



CHARACTERISTICS OF SMALL FARM FAMILIES

(By John C. Crecink, Economic Development Division, ESCS, U.S. Department of Agriculture)

INTRODUCTION

Over the last several decades, small farms have been described among other things as family farms, farms with limited acreage, farms with a small volume of agriculture sales, limited resource farms, subsistence farms, retirement farms, and part-time farms. Also, these farms have been, rightly or wrongly, closely identified with poverty situations. A common thread running through each of these, and other descriptions of small farms, is that somehow they fall outside the mainstream of commercial agriculture. Periodically, public concern has arisen over the plight of the "small farms" per se and with the operator families associated with these farms. Since the early 1950's, the Federal Government's main small farm programs have been aimed at the entire rural community focusing attention on the provision of services, nonfarm job opportunities, and special problems of low-income citizens; in other words, poverty programs. The primary objective was to raise the incomes of rural residents, both in terms of money and social services, which in turn was to stem the post-World War II flow of rural families to urban areas. Evidently, rising rural area economic opportunities reduced the outflow of people and has even enhanced return migration to some rural areas.

In the 1970's, several well-publicized groups became interested in the implications of the organization and structure of agriculture for small farm families. The Rural Development Act of 1972 was the beginning of an articulated directive focused on the agricultural production problems of small farmers. The Food and Agriculture Act of 1977 further extended the research and extension activity for small farmers. Secretary Bergland recently emphasized USDA policy to encourage, preserve, and strengthen the small farm as a continuing component of American agriculture.

The small farm has customarily been viewed from two perspectives, as a producing agricultural unit and as a part-time farm unit. In the first instance, the question of size, product mix, financing, and intent of the operator immediately arises. Since agricultural programs for the most part in the past have not been devised to specifically benefit these operators, a definite small farm policy has not been articulated. Many questions arise as to how can these farm operators best be served: What enterprises (crops, livestock, or a combination of the two) are best suited to small farm businesses, what level of mechanization can be attained, what level of intensity and efficiency should be attained, what marketing methods are most appropriate, and what are the expectations of these operators with respect to income. These and similar

questions are not easily answered. In the case of the part-time farm operation, the same questions arise as for the small farm business operator but with the additional concern of planning the farm business operation around the offfarm job or reduced farm worktime because of age or disabilities.

WHAT IS A SMALL FARM?

Just what is it we are talking about when we speak of small farms? Almost every individual who has devoted thought to small farms has derived his own definition or description. Without reviewing these definitions at this time, suffice it to say that common elements are sales volume, size, and income. Obviously, any definition must allow for both farm and off-farm employment by the operator or his family. One popular and widely cited definition is all farms selling less than \$20,000 in farm products. This definition is required by statute only in connection with certain research and extension programs authorized by the Rural Development Act of 1972, as amended. The USDA has recently established criteria to be used to identify small farm families to be aided by its small farm efforts. Under this definition, the families so designated should:

1. Operate farms by providing most of the labor and management.
2. Depend on farming for a significant portion, though not necessarily a majority, of their income.
3. Have total family incomes from farm and nonfarm sources below the median nonmetropolitan family income in their States.

The median income is the value of the middle item when the incomes are arranged according to size. Stated another way, it is defined as that value which divides a distribution so that an equal number of items are on either side of it. The median is an average of position while the arithmetic mean is a calculated mean. One advantage to using the median rather than the mean is, it is not distorted by unusual values and can be calculated when the distribution is "open ended"; that is, where under or less than and over or more than classes are used. The median nonmetropolitan income used is taken from the U.S. Bureau of the Census, "Current Population Reports, Series P-60." These data for 1975 and estimates for 1979 are presented for the Nation and for regions and States in table 1.

Prior to the development of the USDA's criterion, small farms were most often defined as those with less than \$20,000 farm sales. This definition emphasized the farm business as the primary policy concern and includes approximately 1.7 million farm operators. On the other hand, the USDA's median income guideline includes an estimated 1.3 million farm operators. A majority of the same farm operators (an estimated 1 million) would be included under either criteria. One compelling reason for adopting the USDA definition in preference to the farm sales definition is that those farm operators included under the USDA's definition share a common problem—moderate to low income—whereas those farm operators with agricultural sales of \$20,000 or less do not necessarily have a common problem. The USDA definition, unlike the \$20,000 sales definition, excludes those farm operators with relatively large off-farm incomes and include some operators with more than \$20,000 farm sales who, for various reasons, had relatively low net total family incomes.

In 1975, the median nonmetropolitan family income for the United States was approximately \$12,000; by 1979, it is estimated to have reached \$15,700 (table 1). Median incomes for the continental United States ranged from a low of \$9,400 in Kentucky to a high of \$15,800 in Connecticut. All but two States with median nonmetropolitan less than the U.S. average were located in the South. (The exceptions were Missouri and New Mexico.)

TABLE 1.—NONMETROPOLITAN MEDIAN FAMILY INCOME BY DIVISION AND STATE, 1975 AND 1979

Region, division, and State	¹ 1975	² 1979	Region, division, and State	¹ 1975	² 1979
Northeast.....	\$13,900	\$18,200	South—Continued.....		
New England.....	13,900	18,200	South Atlantic—Continued.....		
Connecticut.....	15,800	20,600	North Carolina.....	\$11,100	\$14,500
Maine.....	11,400	15,000	South Carolina.....	10,900	14,200
Massachusetts.....	15,100	19,800	Virginia.....	11,000	14,440
New Hampshire.....	13,800	18,100	West Virginia.....	11,300	14,800
Rhode Island.....	14,600	19,000	East South Central.....	9,800	14,800
Vermont.....	12,400	16,200	Alabama.....	10,300	13,400
Middle Atlantic.....	13,900	18,200	Kentucky.....	9,400	12,300
New Jersey.....	16,700	21,800	Mississippi.....	9,600	12,500
New York.....	13,600	17,700	Tennessee.....	10,000	13,100
Pennsylvania.....	12,500	16,400	West South Central.....	10,000	13,100
North Central.....	12,900	16,800	Arkansas.....	9,500	12,400
East North Central.....	13,400	17,400	Louisiana.....	10,600	13,900
Illinois.....	14,100	13,400	Oklahoma.....	10,400	13,600
Indiana.....	13,300	17,400	Texas.....	10,000	13,000
Michigan.....	13,400	17,500	West.....	13,100	17,100
Ohio.....	12,800	16,700	Mountain.....	12,800	16,700
Wisconsin.....	13,200	17,200	Arizona.....	12,100	15,800
West North Central.....	12,300	16,100	Colorado.....	13,700	17,900
Iowa.....	13,600	17,800	Idaho.....	12,500	16,640
Kansas.....	12,200	15,900	Montana.....	13,200	17,300
Minnesota.....	13,600	16,500	Nevada.....	13,900	18,200
Missouri.....	9,700	12,700	New Mexico.....	10,700	13,900
Nebraska.....	13,200	17,200	Utah.....	12,800	16,700
North Dakota.....	13,300	17,400	Wyoming.....	14,800	19,300
South Dakota.....	11,700	15,300	Pacific.....	13,400	17,500
South.....	10,600	13,700	Alaska.....	22,400	29,300
South Atlantic.....	11,000	14,300	California.....	12,600	16,440
Delaware.....	14,000	18,300	Hawaii.....	15,900	20,800
Florida.....	11,200	14,600	Oregon.....	12,700	16,600
Georgia.....	9,700	12,700	Washington.....	13,600	17,700
Maryland.....	13,500	17,600	United States.....	12,000	17,500

¹ Source: U.S. Bureau of the Census, Money Income and Poverty Status in 1975 of families and persons in the United States (spring 1976 Survey of Income and Education), Current Population Reports, series P-60, Nos. 110, 111, 112, and 113.

² Estimated by multiplying the 1975 nonmetro median income by the change in the Consumer Price Index.

SMALL FARMS: NUMBER AND LOCATION

Applying the USDA median nonmetropolitan income criteria, over one-half (52 percent) of the U.S. farms are small and they are distributed throughout the country (table 2). The heaviest concentration of small farms is in the north-central and South regions. These two regions contain 84 percent of all farms and 86 percent of the small farms. Texas not only has the greatest number of farms of any State, but it also has the greatest number of small farms. Six States have more than 50,000 small farms—Iowa, Missouri, and Minnesota in the north-central region, and North Carolina, Kentucky, and Texas in the South. Together, these States have nearly one-third (31.4 percent) of all small farms (table 2).

Although the New England States have relatively few farms, almost two-thirds (66 percent) of their farms are small. At the other extreme, only slightly more than one-third of the farms in the Pacific region are small. That small farms are distributed throughout the

TABLE 2.—NUMBER OF FARMS AND USDA SMALL FARMS¹ BY REGION, DIVISION, AND STATE, 1973

Region, division, and State	Number of farms ²	Number of USDA small farms	Region, division, and State	Number of farms ²	Number of USDA small farms
Northeast.....	137,200	71,600	South—Continued		
New England.....	25,600	16,900	South Atlantic—Continued		
Connecticut.....	3,600	2,400	North Carolina.....	99,000	59,400
Maine.....	7,600	5,000	South Carolina.....	35,000	21,000
Massachusetts.....	4,800	3,200	Virginia.....	59,000	35,400
New Hampshire.....	3,000	2,000	West Virginia.....	19,500	11,700
Rhode Island.....	700	400	East South Central.....	299,000	164,500
Vermont.....	5,900	3,900	Alabama.....	56,000	30,800
Middle Atlantic.....	111,600	54,700	Kentucky.....	96,000	52,800
New Jersey.....	7,600	3,700	Mississippi.....	53,000	29,200
New York.....	45,000	22,100	Tennessee.....	94,000	51,700
Pennsylvania.....	59,000	28,900	West South Central.....	325,000	185,300
North Central.....	1,011,500	498,900	Arkansas.....	58,000	33,100
East North Central.....	451,000	207,400	Louisiana.....	35,000	20,000
Illinois.....	107,000	49,200	Oklahoma.....	73,000	41,600
Indiana.....	89,000	40,900	Texas.....	159,000	90,600
Michigan.....	63,000	29,000	West.....	236,900	100,800
Ohio.....	97,000	44,600	Mountain.....	109,900	53,800
Wisconsin.....	95,000	43,700	Arizona.....	5,800	2,800
West North Central.....	560,500	291,500	Colorado.....	26,500	13,000
Iowa.....	121,000	62,900	Idaho.....	23,300	11,400
Kansas.....	72,000	37,400	Montana.....	21,700	10,600
Minnesota.....	104,000	54,100	Nevada.....	2,000	1,000
Missouri.....	118,000	61,400	New Mexico.....	11,200	5,500
Nebraska.....	63,000	32,800	Utah.....	12,200	6,000
North Dakota.....	41,000	21,300	Wyoming.....	7,200	3,500
South Dakota.....	41,500	21,600	Pacific.....	127,000	47,000
South.....	944,500	542,100	Alaska.....	300	100
South Atlantic.....	320,500	192,300	California.....	60,000	22,200
Delaware.....	3,000	1,800	Hawaii.....	3,700	1,400
Florida.....	35,000	21,000	Oregon.....	30,000	11,100
Georgia.....	54,000	32,400	Washington.....	33,000	12,200
Maryland.....	16,000	9,600	United States.....	2,330,100	1,213,400

¹ Farm families with incomes below the nonmetropolitan median family income.

² Source: Farm Numbers, Crop Reporting Board, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture, Washington, D.C., Dec. 28, 1978.

United States is indicated by the fact that at least one-third of the farms in each State are classified as small. The range is from 67 percent in Connecticut, Massachusetts, and New Hampshire to 33 percent in Alaska. The Northeast and South has proportionally more of the low-income farm facilities than the national average, the West proportionally less, and the north-central approximately the same. Obviously, the small farm problem is not limited to specific States or regions but is present in every State and region.

SMALL FARM CHARACTERISTICS

Small farms control about 30 percent of total farm assets, a sizable portion of the total but less than their relative proportion of the total number of farms (table 3). Their assets are relatively unencumbered by debt compared with large-scale farmers. The young low-income farmers (under 35 years of age) have fewer assets and greater debt than the middle or older aged small farm operators. The average small farm operator controlled only about 60 percent of the assets controlled by the average of all farmers. The younger and the older small farmers controlled even less, approximately 40 percent.

Some small farm operators control considerable acreage. For example, in 1975 approximately 20 percent of the small farm operators operated farms of 500 acres or more. This varied according to the age of the small farm operator, with the middle age group operating the

largest percentage of farms with 500 acres or more. However, in all three age groups, median farm size was smaller than median farm size for all operators. Also, 92 percent of all farm operators 65 years of age or older operating farms of 100 acres or less had family incomes less than the median nonmetropolitan family income. Almost 60 percent of the older two age groups in this category also had low incomes.

TABLE 3.—CHARACTERISTICS OF ALL FARM FAMILIES, SMALL FARM FAMILIES, AND SMALL FARM FAMILIES BY THE AGE OF THE HOUSEHOLD HEAD, 1975

Characteristics	All farm families	Total	Families with total income below the median nonmetropolitan income—Age of the household head		
			Under 35 yr	35 to 64 yr	65 yr or older
Farming principal occupation ¹ (percent).....	69	69	63	63	87
Working off-farm 100 plus days (percent).....	35	36	48	41	12
Average total family income.....	\$11,700	\$5,600	\$6,000	\$5,900	\$4,600
Average net farm income.....	\$3,800	\$1,500	\$2,700	\$1,700	\$1,300
Average off-farm income.....	\$7,900	\$4,100	\$3,300	\$4,200	\$3,300
Average value of farm sales.....	\$73,000	\$36,000	\$34,000	\$37,000	\$12,000
Median farm size (acres).....	185	135	157	151	99
Median market value of farm assets (in thousands).....	\$232	\$142	\$89	\$177	\$94
Median net worth.....	\$204	\$110	\$70	\$146	\$93
Type of farm ² (percent):					
Small grain.....	9.8	8.7	8.6	8.9	7.9
Cotton/tobacco.....	2.1	2.3	2.4	2.5	1.9
Corn/soybeans.....	27.1	23.8	30.2	24.9	17.2
Potato.....	.7	.4	.5	.5	.1
Other field crops.....	.7	.6	.5	.7	.4
Vegetable.....	2.4	2.2	1.6	2.1	2.9
Horticultural.....	17.7	21.1	19.3	20.1	25.3
Livestock, dairy, and general.....	39.4	40.8	36.9	40.3	44.2

¹ That occupation in which operator spent 50 percent or more of his work time in 1975.

² Base on crop using the largest acreage in 1975.

Source: Special tabulations from the 1975 Farm Productions Expenditures Survey and the 1973 Farm Living Expenditures Survey conducted by ESCS, USDA.

Because small farms are distributed more or less uniformly throughout the United States the association between type of farm and low-income farm families does not appear to be strong. The exceptions to this may be in the Lake States where small dairy operations predominate and the Southeast where small tobacco farms are located.

The share of total farm sales provided by small farm operators is substantially less than their numbers would indicate. The average small farm had sales of about one-half of the average volume of all farms. Small farms provide an estimated 27 percent of total farm sales although they account for 55 percent of the farms. The older low-income farm operators have average farm sales about two-thirds less than other small farms.

SMALL FARM FAMILY CHARACTERISTICS

Small farm operators appear to be slightly older than all farm operators and considerably older (4 years) than those operators with incomes greater than the median nonmetropolitan. Farm operators 65 years old or older are much more likely to have low incomes than those under 65 years. While only about a fifth of the small farm operators are 65 years old or older, over three-fourths of all operators in this age category are small farmers. Slightly more than the proportionate

number of young (under 35 years) farmers were on small farms and, conversely, slightly less than the proportionate number of midage farmers were small farmers.

The proportion of older small farm operators whose principal occupation is farming is much higher than that of younger operations. This is also reflected in the percentage of farm operators working off the farm 100 days or more during the year. Almost none of the 65 year old or older small farm operators worked off-farm, whereas between 40 and 50 percent of the younger small farm operators did.

Approximately 16 percent of the total farm population in any given year is in poverty. Limited data available suggest that the incidence of poverty among farm families headed by persons 65 years old or older is quite high, perhaps approaching 60 percent.

About 6 percent of the farm population are minorities, predominately blacks located in the South and Spanish surname farmers in the Southwest. Compared with other farmers, minority operators are generally older, work fewer days off the farm, have smaller farms, have larger households, and tend to be primarily engaged in crop production. Most minority farm operators (90 percent) sell less than \$20,000 in farm products from the farm they operate. Minority farm families are more likely to be heavily dependent on farm earnings as a component of their total family income. This accounts, in part, for their extremely low total family income. For example, about 92 percent of all black farm families had incomes below the median nonmetropolitan family income in 1977.

Up to this point, only the median nonmetropolitan family income provision of the USDA definition has been used to identify small farms. From available data, rough estimates can be made applying the significant income provision in addition to the median income provision. If we assume that 10 percent of family income has to come from farming, then the number of small farms will be reduced by about 25 percent. If 15 percent is used, the decrease in number would be approximately 33 percent; at 25 percent it would be 40 percent, and at 50 percent it would be 56 percent. Assuming that no more than 20 percent of the total farm labor requirement could be hired would add to each of the above estimates approximately 5 to 6 percentage points. This simply means that if all three criteria are met simultaneously, then for the 10-percent farm income level, the number of farms classified as small would be reduced by approximately 40 percent over the number of small farms when using only the median nonmetropolitan family income criteria.

The effect of applying the three criteria to the different regions would vary widely, depending to a large extent upon the importance of farm income as a component of total family income. The least reduction in small farm numbers would occur in the Lake States of the north central region while the greatest reduction would occur in the Pacific region.

IMPLICATIONS

Small farmers may not contribute greatly to the total U.S. output of food and fiber, but they do represent a majority of all U.S. farmers. Operators of small farms depend entirely on farm income for family

living; others combine farming and nonfarm income, either from off-farm employment or from income transfers, as their sources of family income. The small farm population is a clearly heterogeneous one. Small farms are located throughout the agricultural areas of the United States. Some of the operators of these farms are elderly while others are young and just getting started; some have physical disabilities that inhibit their working full time on or off the farm; and they are engaged in all types of farming operations.

Programs and policies to assist small farm operators must be diverse to accommodate the heterogeneity of the population. Some small farmers can benefit most from programs to improve farm operations. Others can benefit most from increased off-farm employment opportunities. Still others, such as the elderly, may benefit most from improved access to public assistance and social services. The exact combination of programs depends almost entirely on individual family circumstances. Any effort to assist small-farm families must take account of the goals and aspirations of the family and the role that farming plays in family well-being.

USDA SMALL FARM EFFORT

(By D. Craig Ahlberg, Farmers Home Administration, U.S. Department of Agriculture)

PURPOSE

Beginning early in 1978, the USDA has implemented a special inter-agency effort directed at U.S. small farmers. Following are some of the purposes of the effort:

1. Give immediate assistance to as many small farmers as resources permit.
2. Stimulate cooperation among USDA agencies for the benefit of small farmers.
3. Creatively combine resources of the Community Service Administration, ACTION, and USDA.
4. Mobilize resources of universities, churches, public interest groups, and other private sector organizations to benefit small farmers.
5. Review effectiveness of USDA programs and activities related to small farmers and suggest improvements.

USDA ACTIVITIES TO DATE

Small farm conferences

In the summer of 1978, Small Farm Conferences jointly sponsored by USDA, the Community Services Administration, and ACTION, brought together 410 small farmer delegates at locations in Alabama, Iowa, Oregon, New Mexico, and Maine. Approximately eight small farmer delegates from each State met for the purpose of identifying key problems and issues important to small farmers in their region. The conferences were designed to allow maximum participation and free expression by the farmer delegates. Federal agency personnel attended primarily to listen and to provide information when requested.

Each regional conference agenda included the following topics:

- Access to capital and credit.
- Production and management.
- Marketing.
- Additional income.
- Farm family living.
- Alternate energy sources.

In February of 1979, a sixth conference was held in Albuquerque, N. Mex., to elicit needs of American Indian and Alaska Native small farmers. The Bureau of Indian Affairs, The National Congress of American Indians, and the National Tribal Chairmen's Association joined the USDA, CSA, and ACTION as conference sponsors. Subjects discussed at the Albuquerque conference included forestry, ranching and livestock, tribal farming, individual farming, aquaculture and

horticulture. A joint task force composed of American Indian and Native Alaskan representatives along with Federal officials is systematically reviewing barriers preventing full access to Federal farm programs.

Detailed, printed summaries of the six conferences were prepared. In many cases meetings occurred within a few weeks after the conference, attended by USDA, CSA, and ACTION officials, as well as other interested parties, to begin strategies for conference followup.

Secretary's memorandum

On January 3, 1979, Bob Bergland issued Secretary's Memorandum 1969 which states in part,

It is the policy of this Department to encourage, preserve and strengthen the small farm as a continuing component of American agriculture. It is further the policy of the Department to provide on its own initiative when appropriate, assistance which will enable small farmers and their families to expand the necessary skills for both farm and nonfarm employment to improve their quality of life. It is a priority of this Department to encourage small farm operators to participate more fully in all USDA programs.

The memorandum established a Policy Committee on Small Farm Assistance chaired by the Assistant Secretary for Rural Development. The members of the Policy Committee are the USDA Assistant Secretaries and the Director of Economics, Policy Analysis and Budget. Also created by this memorandum was the USDA Small Farm Working Group composed of representatives from USDA agencies providing small farm services along with staff from ACTION, CSA, and the Department of Commerce.

Directives to State rural development committees

In February of 1979, as a direct step in implementing the Secretary's memorandum on small farms, the State Rural Development Committee chairpersons were asked to help the Department reach the following goals:

1. Improve small farm family income levels, and increase family skills for both farm and non-farm employment.
2. Improve the access of small farm families to adequate housing and essential community facilities and services.
3. Provide more equitable access to USDA program opportunities by targeting efforts on small farmers.
4. Create and implement a process for involving the private sector and local, State and Federal agencies in establishing program priorities that will benefit small farm families.
5. Update and improve the technical expertise and sensitivity of USDA agency personnel to make them more responsive to the needs of small farm families.

The memorandum, signed by four USDA Assistant Secretaries, designated as small farm families those who:

- Operate a farm by providing most of the labor and management.
- Have a family net income, from farm and nonfarm sources that is below the median nonmetropolitan income in the State.
- Depend on farming operations for a significant, though not necessarily a majority of their income.

The memorandum established small farm committees in each State to include representatives not only of key USDA agencies but also Community Services Administration (CSA) and ACTION. The small farm committees were requested to refine and implement a plan of action to provide agency services to small farm operators and their families within the States. Small farm committees, as part of the action plan, were asked to indicate changes that should be made in Federal regulations, procedures, and laws to improve services to small farm families.

Annual review of small farm policies and programs

At the same time that the USDA Assistant Secretaries communicated with the State rural development committees, they issued a memorandum to all agency administrators, informing them of the Secretary's memorandum, outlining the Department small farm goals, and presenting the definition of small farm families to be used by the Department. The memorandum also stated that:

An annual review and evaluation of all USDA policies and programs as they concern assistance to small farm families shall be conducted. We will insure that the specific data necessary for a meaningful evaluation are compiled. The Department will expand the annual report ordered by Congress on small farm research and extension to include an evaluation of all USDA small farm activities.

Small farm family assistance projects

The February 26, 1979, memorandum to State rural development committees invited applications for small farm family assistant projects (SFAP). The projects were designed to combine resources of USDA, CSA, ACTION, and other public and private agencies, and direct them to a specific group of small farmers. The SFAP's are supported primarily by redirected funds from USDA, CSA, and ACTION.

The small farm family assistance projects offered an opportunity not only to field test improved cooperation among USDA, CSA, and ACTION, and other resources, but also served as a means of identifying program and policy changes required to better serve small farmers.

Seventeen projects were chosen:

Alabama.—Concerted training and technical assistance to small farmers in a portion of Bullock County, in the Alabama Black Belt.

Colorado.—Support of Four Corners Rabbit Producers Cooperative in Durango, Colo.

Georgia.—Conservation tillage demonstration project in 5 counties of central Georgia.

Hawaii.—Improved technology transfer and management assistance for 205 small farmers on four islands.

Kentucky.—Attention to a wide range of social and economic issues of small farmers in Fleming County, eastern Kentucky.

Louisiana.—Training and demonstration farm for low-income residents in 3 parishes of northeastern Louisiana.

Maine.—Support for Kennebec Valley Growers Cooperative, a vegetable marketing cooperative in 4 counties of coastal Maine.

Mississippi.—Concentrated technical assistance in food production, processing, and marketing as well as family social services in Winston County, Miss.

Missouri.—Swine project for small farm families in the Bootheel section of Missouri.

Nebraska.—Statewide limited resource family livestock projects.

Nevada.—Conservation and irrigation project on the Walker River Indian Reservation in Mineral County, Nev.

New Mexico.—Sheep production project for small farmers in north central New Mexico.

Oklahoma.—Intensive assistance project for 10 farms in each of 10 counties in Oklahoma.

Oregon.—Credit, marketing, and farm management needs of 40 small farm families in Polk, Yamhill and Marion Counties, Oreg.

Rhode Island.—Water quality project for small farms in northern Rhode Island.

South Dakota.—Coordinated technical assistance for small farmers in Charles Mix County. Some of the targeted farmers are native Americans.

West Virginia.—Farm production, housing, and conservation project for 500 farm units in upper Pocatalico watershed.

Small farm research task force

A task force was appointed by the Research Subcommittee of the USDA Rural Development Coordinating Committee to survey ongoing research benefiting small farm families and to suggest an agenda for further research. The report of this committee is expected to be available in November 1979.

Public information

As part of USDA's small farm effort, two issues of a small farm family newsletter have been published. A strategy for expanded public information activities for fiscal year 1980 has been prepared.

OUTLOOK FOR USDA SMALL FARM EFFORT IN 1980

Following are some of the planned USDA activities that will be coordinated by the small farm working group in fiscal year 1980:

Regional meetings

Beginning in January 1980, key members of the small farm committee in each State, along with regional representatives of CSA and ACTION, as well as some representation from the private and non-profit sector will assemble at five regional locations. At these regional meetings the participants will be able to share success stories and discuss roadblocks they have encountered in attempting to serve small farmers at a statewide and county level. Preliminary learnings from the small farm family assistance projects will be available for review. There will also be time for interaction between Federal personnel and key representatives of nonprofit and other private sector organizations. The result should be an assessment of progress made since the 1978 small farm conferences and a clarified view of what is to be accomplished in fiscal year 1980 by the State and county small farm committees.

Implementation of State small farm action plans

The national working group will be most interested in following implementation of the 1980 action plans developed by the small farm

committee in each State. It is hoped that site visits can be made to most small farm committees in fiscal year 1980, especially those committees that are not among those supervising one of the 18 SFAP projects.

Monitoring of small farm family assistance projects

The USDA working group will be closely monitoring and supporting the small farm family assistance projects. An interdepartmental committee composed of representatives of USDA, CSA, and ACTION is currently evaluating the projects.

Participation of public interest groups and private sector

Increased contact will be made with public interest groups and the private sector in fiscal year 1980 to encourage their participation at the national, State, and local level in cooperation with USDA to identify issues, share knowledge, and coordinate direct technical assistance to small farmers.

Transfer of learnings

Fiscal year 1980 will see a beginning of systematic transfer of learnings derived through the small farm effort since early 1978. Information will be transferred among Federal departments, between agencies, through the university system, including land-grant colleges and the regional rural development centers, and among farmers and the general public.

Review effectiveness of USDA small farm activities

In 1980 the Department will follow through on the February 26, 1979, call for an annual review of USDA's policies and programs concerning assistance to small farmers:

USDA interagency cooperation will be reviewed and improvements will be suggested.

Cooperation between USDA, CSA, and ACTION at the National, State and local level will be examined and improvements will be suggested.

Based on the document prepared by the small farm research task force, further attention will be given to research designed to benefit small farmers and specific projects will be initiated.

Extension and technical activities will be reviewed and improvements will be suggested. Part of the review will be based on a comparison of public and private extension and technical assistance activities.

Fiscal years 1981 and 1982 changes

One final product of the current USDA small farm effort will be recommended fiscal years 1981 and 1982 program and budget changes and research priorities based on learnings from the 1978 small farm conferences, the small farm family assistance projects, the small farm action plans of the State rural development committees, and other input received by the USDA small farm working group from the private sector, public interest groups, and the general public. Several program modifications have already been made in response to issues encountered in implementing the small farm family assistance projects.

SIGNIFICANCE OF USDA SMALL FARM EFFORT

It might be useful, in conclusion, to highlight some significant results of the USDA small farm effort to date.

Commitment and focus

Since early in 1978, USDA has had a heightened commitment to American small farm families. This has been demonstrated through the Secretary's and Assistant Secretaries' memorandums mentioned above, which set in motion a wide range of activities directed to small farmers. Equally important has been the establishment of structures such as the USDA small farm working group and the State and county small farm committees that can be a central management point not only to direct USDA activity but to receive input from other public entities, private organizations, and the general public. In my opinion, the structure established early in 1979 for dealing with small farm issues will prove to be a management device that can produce effective results.

Participation of small farmers

The USDA effort began in a most appropriate fashion by listening to the problems and opportunities expressed by small farm delegates. Through written communication and personal contact with all the small farm delegates, USDA will benefit from their experience and will test the effectiveness of new Federal directions.

Definition of small farm family

The USDA small farm working group, with substantial assistance from the Economics, Statistics, and Cooperative Service, arrived at a small farm definition that recognized the current status of American agriculture and attempted to identify those families who should receive first attention in any redirection of public and private resources. The new definition focuses on the small farm family and is concerned with both farm and non-farm income. It has been the policy of the USDA small farm working group to consider the broad range of human needs of small farm families including nonfarm employment, health, education, transportation, community services, et cetera.

USDA coordination

While it is often assumed that USDA agencies routinely coordinate their activities at the national, State, and local levels, this is not always the case. An interagency effort, such as the USDA small farm activity underway since 1978, provides concrete opportunity, through the small farm family assistance projects and through the State small farm action plans, for agencies to coordinate and integrate their programs for maximum impact at the point of delivery. At the national, State, and local levels we are able to identify programs that are not as complementary as they might be. Finally, the interagency small farm effort offers a context for staff of one agency to maintain awareness of new programs or program modifications of other USDA agencies.

Cooperation with CSA and ACTION

Perhaps the most significant decision made in the small farm effort was an early one that established close coordination with CSA and

ACTION. This has resulted in a greatly enhanced array of resources available to local small farm projects. Both CSA and ACTION have many years of experience with direct technical assistance to low-income rural families. USDA is benefiting from this experience by interacting with CSA and ACTION staff as we seek to serve the same families. It is hoped in 1980 to expand the interagency cooperation between USDA, CSA, and ACTION. In addition, we will work at national, State, and local levels with other Federal agencies to coordinate and focus small farm resources.

Private sector participation

The small farm working group has maintained contact from the very beginning with a wide range of public interest groups concerned with small farm issues. Private participation in delivery of resources is encouraged as one component of the small farm family assistance projects. It is hoped in fiscal year 1980 to intensify cooperation with churches, nonprofit groups, public interest organizations, foundations, and private industry to direct attention and resources to the needs of small farm families.

Stimulation of State and local activity

The USDA small farm effort can be effective only if most of the activity occurs at a State and county level. The small farm family assistance projects have proven to be a creative tool not only in the 18 States with approved projects. It is safe to say that an additional 18 States have developed small farm projects that rival in quality those chosen for redirected national and regional funds. The intention of the USDA small farm effort is to continue to work through the State small farm committees to stimulate increased coordination of resources directed to small farmers.

New learnings

Although most of this paper has reviewed the process of the USDA small farm effort, some mention should be made of the content. Throughout the small farm effort, at national, State, and local levels, we hope to stimulate, document, and transfer new learnings in small-scale agricultural production including appropriate technology, farm equipment, enterprise combinations, and renewable energy resources. We are concerned with landownership, land title issues, land use, and conservation. We are examining financing of small farms including the optimum mix of farm and nonfarm income. We are much involved in marketing issues and the role of cooperatives. The small farm effort will disclose suggested areas for further research. Finally, there is much interest in new techniques for extension and technical assistance for small farmers.

PERSPECTIVES IN RURAL DEVELOPMENT: UNDERSTANDING CONCEPTS, PROCEDURES, AND PRINCIPLES

(By William C. Boykin, Sr., Alcorn State University)

A TREND IS REVERSED

After a long period of outmigration of the American people from rural areas to metropolitan areas, the movement of people to rural areas has begun. This trend began to be felt during the 1970's. Americans have changed their minds. Now they are moving back to the country. Two of the unwritten freedoms of the American people are the freedom to change their minds and the freedom to be mobile. These freedoms placed pressures on metropolitan areas during the periods of migration to the cities; these same pressures for services are impinging on rural areas now that the trend has reversed. Hence the need for purposeful and deliberate rural development.

EFFECTS OF THE REVERSED TREND

Today some 55 million, or over 25 percent of our population, live in rural, nonmetropolitan areas of the country. Rural areas no longer depend solely upon farming as their sole means of survival. Yet, farming is important to the economic survival of the Nation and to these areas.

We live in a small world now. The miracle of mass communication has brought events of the Nation and the world into the living rooms of even the poverty-stricken people in rural America. We are tending toward a mass culture, regardless of where we live. Along with this phenomenon has come a greater homogenization of the aspirations and expectations of an erstwhile isolated rural people. Rural people now demand, and expect to get, more and better education, more and better housing, improved health care delivery services, expanded police protection, public recreational facilities—amenities once had or expected by only urban dwellers. With the eroded tax base in some rural areas, the demand for resources—money, men, and materials—has increased beyond the capacity of many rural communities. This is why rural development must be a purposeful and deliberate attempt of people living in the communities, working together, to marshal all of the resources available for the accomplishment of the task of improving their communities. The immensity of this task is brought into focus when it is remembered that 47 percent of the Nation's population with incomes below the "poverty line" live in rural areas.

WHAT IS RURAL DEVELOPMENT?

Rural development means different things to different people. In general "development" can be defined as any general improvement in

the place in which we live or work. However, we prefer to think of rural development as a purposeful and deliberate attempt of people, working together, to solve their common community problems of economics, human resources, community facilities, and environment.

The Federal Government defines "rural" areas as any area which does not contain a city with a population of 50,000 or more. A rural area is, of course, the open countryside. It is also a hamlet of, say, 250 people, a small town of 10,000, or a small city of 40,000.

Your "community" is generally thought of as the geographical area in which you live—your county or even your neighborhood. True, it is these, but your community is more. It can be the road or street on which you live, the patrons of your local school, your civic club, your church, your voter precinct or ward. Basically, a community is an association between people and their organizations in a locality, who share common interests and goals or who are affected by common problems and will benefit from solving them. So "rural development" is the process of improving the nonmetropolitan areas in which we live or work.

PROCEDURAL PRINCIPLES

History is replete with both successful and unsuccessful attempts to improve rural communities. Most of these projects have been successful or unsuccessful depending, not so much upon their worthiness, as upon the procedures employed. These procedures, for the most part, have to do with the involvement of people affected by the problems. What are the essential procedural principles of people involvement?

(1) *People in the community decide what they want.*—Lay people well might not be able to define their goals but they, in their own way, know what they need. The leaders will need to develop mechanisms for arriving at people's perceptions of these needs. Available to leaders are systematic studies (surveys), community meetings, data bases, et cetera, to name a few. The important consideration here is that the people affected by problems decide what their needs are.

(2) *People determine the action necessary to reach their goals.*—There is a tendency to prompt a course of action as the course which should be taken. To the contrary, alternative courses should be nominated by as many citizens in the community as feasible. Then, the community should decide, among the available alternatives, which actions should be initiated.

(3) *Gather or survey available resources for doing the job.*—There are many sources of information relative to the resources in most communities. There must be a knowledge base upon which the project proceeds. A knowledge of the availability of resources is important because this knowledge affects the scale of the undertaking.

(4) *The people should be unified into a team.*—All undertakings must have leaders. But, successful undertakings cannot afford "stars." Every member of a good ball team has a definite function to serve. There should be assignment of duties and responsibilities for every person or organization in a rural development undertaking. It is the job of the leader to unify and coordinate these functions toward the attainment of the ultimate goal. The central theme is "people working together."

PRINCIPLES OF RESOURCES

Just as there is a sequence of events or procedure recognized as productive of success, there are certain principles which should be followed to facilitate the procedure. These principles are recognized as (1) scale (resources), (2) scope (impact), and (3) access (entré).

Scale.—Means that the available supply of men, money, and materials existing in the community must be adequate to the job to be done. The resources necessary to provide an airport and air travel in a community of 400 persons might well not fit the scale of the community. Alternatives are available: Forget it, or expand the community of interest to include a larger general area and, hence, expand the supply of men, money, and materials.

Scope.—It includes all the effects and implications of a development activity. In what positive and negative ways will the successful completion of a given project impact upon the community? Recognition of this principle enables community leaders to avoid creating worse problems with otherwise worthwhile projects. Some industrial plants help solve unemployment problems but, at the same time, create worse environmental problems.

Access.—Energy, knowledge, money, materials, and services must not only exist. They must be accessible in quantities needed for the undertaking. Industrial concerns most often locate where there is available an adequate supply of energy (in desired form), knowledgeable and concerned people, reliable banks, and raw materials for processing, and services for their employees.

PEOPLE PRINCIPLES

Just as there are procedural principles and principles of resources in rural development there are, also, principles of working with people. Generally these principles are rooted in the "Concepts of Democratic Government":

(1) *Participation must be free and open to all who are interested.*—Interest of people may be based on either the beneficial affects or the detrimental effects, if any, to the people involved. The process of exploration or consideration of the undertaking, together with decision-making, must not bar people because of race or color, age, sex, religion, or because of presumed opposition. Affirmative procedures should be employed to preclude the violation of this principle.

(2) *Broad representation can increase vision and strengthen rural development projects.*—Individuals in a community represent, not only themselves, but also organizations to which they belong. Therefore, positive steps should be taken to insure participation by individuals and various interest groups. It is not uncommon for proposed community development projects to be beneficial to one segment of a community and, at the same time, to be detrimental to the interests of another.

(3) *General agreement is more preferable than "majority rule" as a basis for social or technological change.*—Some departure is noted here from the principles of representative democracy. But, this departure perhaps is justified on the basis of what we know about the psychology of working with people. For example, many proposed com-

munity development projects involve people who are in favor of, neutral to, or opposed. Voting for "majority rule" sometimes has the ill effect of polarizing the community into warring camps. Then, why not permit those who are neutral or opposed to "save face" by not forcing them to take sides. A simple majority should be suspect in rural development undertakings. If there is serious opposition, there are probably good reasons, and they should be aired.

(4) *Successful community development depends upon competent leadership.*—No amount of drivership will induce a lethargic people or a people who are opposed to a community development project to carry this project forward, as worthy as it might seem. Good leadership, however, will be effective in educating the people to understanding the why of rural development and the how of marshaling their resources for their benefit. In leadership we make a distinction between "selling" a project and developing the necessary educational base among people for intelligent decisionmaking. The former is indoctrination; the latter is education—the true domain of community rural development specialists.

LEADERSHIP

Leadership has been defined by Torrence and Keithlow in their work "Leadership in a Democracy" as: "that trait of character whereby one is able to induce others to work toward the attainment of goals which they come to find desirable." The terms "we," "us," "ours" become bywords for successful leaders. Rural development leaders must understand and apply principles of procedure, scale, scope, access, and people if their work is to be successful.

SUMMARY

1. The trend in American living is to the nonmetropolitan rural area.
2. More than 25 percent of the Nation's population lives in rural areas, which are defined by the Federal Government as areas in which towns or cities are less than 50,000 population.
3. One thing that all rural areas have in common is that they do have problems, and many of these can be solved through rural development programs.
4. Rural development is the practice of local residents, with common interest, using their own initiative and abilities, and marshaling public and private resources, to solve local problems in order to make their communities better places in which to live or work.
5. "Community" means any group of people who share common goals, common interests, or common problems.
6. The most essential ingredient in any rural development effort is leadership.
7. Leadership in a democracy is that trait of character whereby one is able to induce others to work toward the attainment of goals which they come to find desirable.

COMMENTARY

This presentation is an adaptation of "Training For Rural Development," prepared by the Project Development Network of the

Southern Rural Development Center. It focused on "Understanding Rural Development," Component 1. Other components in this series, available from the Southern Rural Development Center are: (2) "Defining Community Problems and Setting Priorities," (3) "Finding the Best Approaches," (4) "Locating Resources," (5) "Developing and Implementing Action Programs," and (6) "Evaluation."

Attached are descriptions of several community development projects which tend to point up the concepts and principles of rural development that were emphasized in this presentation.

PEOPLE AND JOBS FOR GADSDEN COUNTY: LOCAL INITIATIVE AND COOPERATION FOR DEVELOPMENT¹

The situation.—Gadsden County, Fla., is in Florida's central Panhandle. It borders on Georgia on the north; and Quincy, the county seat, is only 20 minutes northwest of Tallahassee. It is among the poorest counties in the State. Since 1970, the income and employment situation has deteriorated, due mainly to the decline of the shade tobacco industry. From 1965 to 1975, the number of people employed in this industry declined from 18,000 to 3,300. The people preferred to remain in the area rather than to migrate.

The problem.—The unemployment rate in 1976 was 9.2. It was felt that the true unemployment rate was twice as high, due to the questionable method of estimating the rate in rural areas. Because this rate of unemployment was not greatly different from many other such areas, Gadsden County was not eligible for many kinds of public assistance through the Department of Labor and Commerce.

Objectives.—The obvious goal of the county was to provide more jobs for the people to regain lost income and to thereby improve the economic well-being of the population in this rural area.

Procedures.—Local and county officials launched a comprehensive survey to determine the strengths and weakness of the community in terms of existing resources: Men, money, materials as a basis for attracting industry.

Involvement.—Local and county officials, social organizations, government agencies, business firms, the county commission, county extension service, County Manpower, Planning and Development, Department of Social Service, chamber of commerce, Florida A. & M. University, University of Florida. Contacts were made with 30 percent of the households.

Impact.—These survey data are now being used to recruit new industries for the area and to secure several types of Federal assistance.

That, briefly, is the story of "people and jobs for Gadsden County." It is basically one of local people working on local problems with the assistance of the university's cooperative extension and research programs.

CITIZENS INITIATE A ROAD-MARKING PROJECT²

The situation.—Morgan County is in rural Alabama. The roads in the county were not clearly marked in 1978.

¹ Peter F. Korsching, M. L. Upchurch, and Stephen G. Sapp, "People and Jobs for Gadsden County: Local Initiative and Cooperation for Development," Rural Development Research and Education, Spring 1978, vol. 2, No. 1, pp. 11-12.

² Reprint from "Community Resource Development Report," 17, 1 (1978) 1. Alabama Cooperative Extension Service, Auburn, Ala.

The problem.—Drivers, fireman, and visitors for years have been confused about how to find directions.

Objectives.—Citizens and officials of Morgan County felt that the county's road system needed proper markings for quick and easy directions.

Involvement.—The county's Community Rural Development Committee and the county commission provided the leadership, studying the problem, analyzing alternative solutions, and developing plans of action. Several groups and individuals were involved in developing concern about the problem.

Procedures.—The county commission agreed to make road signs for all county roads and furnish specifications and materials for their erection. The Community Rural Development Committee agreed to assume the responsibility for getting the signs erected as specified by the commission.

Impact.—All road signs were erected in 1978 and 1979. Everyone has been pleased with results. They are confident that lives and time will be saved as a result of their effort.

WEST POINT REVITALIZATION ³

The situation.—West Point, Va., is a town of 2,500 at the mouth of the York River. West Point is a thriving town with virtually no unemployment problems.

The problem.—Downtown was dying and losing its status as the community center. Downtown presented a cluttered appearance, which had resulted both from commercial development on a rural arterial highway through town and from a decline in activity in the downtown business district.

Objectives.—Revitalization of the town; recreation development.

Involvement.—The West Point Area Improvement Association (WPAIA) provided leadership in working with the project staff. Extension specialists of the Virginia Polytechnic Institute and State University (VPI & SU) and Virginia State College were involved through a memorandum agreement to include VPI students. The nature of the project involved the whole community, citizens, council, and business.

Procedure.—The WPAIA established a Design Study Steering Committee (DSSC) to work with the project staff. The DSSC commissioned Virginia Tech to develop a contractual agreement for an architectural students project intended to be a design study for West Point. The completed plan included three phases. Phase I, begun in 1979, included the development of welcome area rest stops and primary entrances, built with local labor and financed with local funds. Phase II, also started in 1979, involved planting of trees and shrubs to improve the esthetic quality of the town. Phase III will begin in 1980-81 and involves sidewalk improvements to businesses. Project decisions and attendant actions have been made by citizen participants after thorough discussion of ideas and opinions involved.

Impact.—Community interest in the project has been sustained at a high level as a result of community pride and feeling that the residents of the town are able to improve the community through their efforts. The town now has an attitude of "we can do it."

³ Kevin T. McNamara (Virginia State College), "West Point Revitalization," Rural Development Research and Education, Spring 1979, vol. 3, No. 1, pp. 8-9.

A PRIMARY CARE MEDICAL CENTER: ONE COUNTY'S ANSWER TO RURAL HEALTH CARE NEEDS,⁴ MAHONING MEDICAL CENTER

The situation.—Indiana County, Pa., is located in an area with 21,000 residents in 12 townships and 6 boroughs. Only one physician was located in the area. Most residents had to travel 15 to 20 miles for physician or hospital services.

The problem.—Primary care, that needed by most people, was not readily accessible to the residents. These include dental services, support services such as X-ray and laboratory analysis, referral services, pharmacy and drug stores.

Objectives.—To provide a more accessible center where primary care health services could be provided for the residents.

Involvement.—Good leadership and total community involvement were the most essential ingredients. There was cooperation from State health officials, schools, mental health services, health-related agencies, county officials and other leaders, and the Pennsylvania Cooperative Extension Service. Also involved were the Indiana County community action program, the Marion Center Lions Club, United Mine Workers of America, the Women's Auxiliary of the Mahoning Medical Center. All economic levels, ethnic groups, age groups, and other special interest groups were represented on the board.

Procedure.—The Marion Center Lions Club sponsored a trip to a newly built rural medical center to find out how other rural Pennsylvania areas had dealt with the problem. Application was made to the National Health Service Corps (NHSC) for the placement of three physicians and one dentist in northern Indiana County. No NHSC personnel were placed, but northern Indiana County was declared as "medically and dentally underserved." A telephone survey conducted by Pennsylvania State confirmed that the lack of medical doctors and facilities was seen as a very serious problem. Widespread support was gained by a request of local concerned citizens that leaders discuss the idea of a medical center with local officials. Teresa (Terry) Strong with the Community Action Agency and Ken Martin with Pennsylvania Cooperative Extension Service performed this leadership task. A local company donated 3 acres of land for the site. Over 100 persons attended the first community meeting and a representative board of directors was elected.

Impact.—The 1977 opening of the Mahoning Medical Center made 3 years of hard work worth while. The Cooperative Extension Service has been involved throughout, but the role has been low key: assisting people in doing things for themselves—a prime example of a community recognizing a need and organizing to find a solution.

SUMMARY OF ANNUAL PLAN OF ACTION: GROWTH IMPACTS

(By Bruce Davis, Lincoln-Adams Area Extension Agent)

Local need.—Lincoln County facing growth from: WWP coal-fired electric plant near Creston; mining on Colville Indian Reservation; northern tier pipeline construction.

⁴ Cooperative Extension Service, Pennsylvania State University, "A Primary Care Medical Center: One County's Answer to Rural Health Care Needs." File No. VF2a 3M117 V. Ed. 8-190.

Annual objectives and audiences.—Help general public, county commissioners, planning commission, and social service groups become aware of proposed sources of growth, potential impacts, and methods of managing growth.

Educational methods.—General public—one or more public meetings; county commissioners and planning commission—informal contacts, provide educational materials, personal invitation to public meetings; social service groups—educational materials and programs; organize slide-tape presentation.

Evaluation.—Six criteria listed.

RESEARCH NEEDS IN AGRICULTURAL METEOROLOGY

(By Wayne L. Decker, Cooperative Research, SEA, U.S. Department of Agriculture, Department of Atmospheric Science, University of Missouri)

AGRICULTURAL METEOROLOGY DEFINED

Agricultural meteorology¹ involves the study of how weather and climate variabilities (spacial and temporal) influence the amount of agricultural production, the profitability of farming and the resulting social structure of the rural community. The study includes the impact of these environmental variabilities on the production of crops, forages and domestic animals. Agricultural meteorology includes the design of farm management options which avoid unfavorable weather events or ameliorate the atmospheric condition. The definition of the economic benefits and disbenefits from weather events for farmers and the agricultural infrastructure is also included in agricultural meteorology. Thus, almost every topic studied in agricultural meteorology also involves an application from a physical, biological, or engineering science or from economics.

Research in agricultural meteorology involves investigations which innovates further "weather proofing" of the agricultural system. Currently these research efforts are being conducted in Agricultural Research, SEA, and Economics Statistics and Cooperatives Service, USDA, and the Agricultural Experiment Stations. Of these agencies the research of the Agricultural Experiment Stations comprise the largest total in manpower and money.

Probably because of the events of the 1970's (Russian wheat deal, SAHEL drought and the U.S. midwestern drought of the mid-1970's) the U.S. research and development efforts in agricultural meteorology have received considerable analysis. The National Research Council (1976) sponsored one study which dealt with the identification of research needs dealing with the impacts of climatic fluctuations on agricultural production. The NRC also included an evaluation of the affect of climatic resources on food and nutrition under a study requested by President Ford (NRC, 1977).

In 1975 the USDA and the Land Grant Universities conducted an evaluation of research priorities for agriculture. These efforts culminated in a conference in Kansas City at which farmers and other clientele groups attended. A long "shopping list" of research needs were identified (USDA, 1978), but water research was ranked at the highest priority. Later, USDA (1979) presented a detailed study to the Congress on the impacts of weather and climatic variabilities on agriculture.

¹ By the definition used here the study of agricultural climatology forms a subject of topics under agricultural meteorology.

The Agricultural Experiment Stations have been involved with agricultural meteorology research since the mid-1940's. Recently the University of Missouri (1977) conducted a 2-day seminar on the use of technologies to avoid the weather hazards for agriculture. In October 1979 the State Agricultural Experiment Stations joined SEA, USDA in sponsoring a symposium on the research needs dealing with the impacts on agriculture of weather and climatic events. At workshops held in conjunction with this symposium the 200 participating scientists identified important research areas. This report summarizes their conclusions.

RESEARCH NEEDS

A. Definition of weather imposed stress on grain crops, meadows and rangelands

Plants are stressed by several different environmental events and in many degrees of intensity. In fact, plant stress in the field is probably a usual and regular event rather than a rare occurrence. But, as used here plant stress is an unfavorable plant condition (usually visibly apparent) from which the plant can not completely recover.

Weather imposed stress may come from episodal weather events, such as lethal or near lethal high and low temperatures; or stress may be associated with the accumulative effects from sustained weather patterns, for example continued dry weather. Stress may also be imposed by weather on plant systems indirectly through insects, disease and weeds. In the latter case, the stress occurs because weather favorable for the pests increases the pest population to a level adequate for stressing plants.

There are two major unknowns concerning plant stress. First, it is difficult to recognize the point in time and space at which plant stress begins and to quantify the intensity of stress. This problem is particularly critical for stress imposed by the accumulative effects of weather. Research to find methods for recognition of the onset and the intensity of plant stress should focus on soil water budgeting and remote sensing. Second, the effects of stress on plant development and subsequent yields are not known. When weather imposes a stress on a field of grain, one can only qualitatively estimate yield reduction. Similarly, reduction in production through stress over areas as large as a State or region can not be quantitatively estimated. Research to develop appraisal methods of yield reductions due to stress are yet to be developed.

The definition of stress and its impact on yield is important to agriculture. Quantitative estimates of grain production require information on stress; and the operation of farm management options, such as irrigation, pest management and frost protection, require quantitative information on plant stress and its impacts.

It should be noted that some of the research objectives dealing with stress on plants will be studied by the new Regional Stress Laboratory being established by Agricultural Research, SEA.

B. Modeling plant and pest response to weather and other environmental events

Modeling, as used here, refers to analytical treatments of the effects of weather on plant growth, plant development and economic

yield. The plant responds to the weather through its dependence on the environment by many complicated physical and biological processes. Through these processes, plants take carbon dioxide from the atmosphere to produce dry matter and cool the "biological machinery" by using soil water for evapo-transpiration. There are, of course, many feedbacks between photosynthesis and the cooling processes. To make real progress in research for understanding how plants grow and produce grain, one must study the entire soil-plant-air system. This interdisciplinary approach requires input from soil physicists, plant physiologists and micrometeorologists.

In one form, modeling attempts to mathematically express the biological response to weather variability by defining the change with time of the rates of photosynthesis, respiration, translocation and other important biological processes. These processes are often mathematically expressed in terms of differential equations, which must have the initial conditions mathematically defined, experimentally derived coefficients, and complicated feedback relationships between the biological processes. In the true sense, this modeling technique attempts to simulate growth and grain production through mathematical expressions. Research needs to focus on finding, through experimentation, the coefficients of these mathematical expressions. These coefficients can be expected to vary with crop and stage of plant development. Even after the growth processes for a particular stage of development are effectively simulated, it is still necessary to determine how plants advance from one development stage to another, that is, how plants produce additional nodes, flower, set fruit or grain, et cetera.

A second form of modeling deals with mathematical expressions which simulates the direct impacts of weather variabilities on yields. In this case grain production from large areas, such as the Great Plains, U.S. Corn Belt, etc., is estimated from the observed weather in these areas through regression equations. These regression techniques provide input for most regional and national yield estimates by governments and other assessment groups. Most current regression models do not account for variations in the planting, flowering, and fruit set times from year to year. Thus, this method of assessment requires investigations to find ways of determining crop growth stages for different years over large areas. Operationally, investigations should focus on the development of methods for using remote sensing to determine planted areas for different crops and the stage of crop development. Further research into developing regression methods for large area modeling of production is not as demanding as with developing methods for modeling biological response. In fact, some scientists believe that progress in the estimation of production for large areas is impeded by deficiencies in the models for the biological response.

Insects, disease pathogens and weeds also respond to weather, and these relationships must be expressed in mathematical terms. Perhaps the greatest research challenge involves the development of mathematical expressions which explain both pest and plant development; and, when solved, indicates the impact of pests on plant development and subsequent crop yield.

The use of models of crop and pest response to varying weather has three important applications to agriculture. First, the mathemati-

cal relationships provide estimates of crop production in the agricultural production areas throughout the world. These estimates are essential for formulating marketing, storage and production goals. These models can provide an early warning for disasters imposed by weather related events such as drought, disease, et cetera. Second, plant breeding could be enhanced by the identification of the life stages in plants and the biological processes for which the weather and climate events are critical to plant survival and high yields. Models should identify the plant characteristics plant breeders need to observe in screening plants to isolate superior individuals and varieties. Third, models of crop response provide information concerning farm management options. Models can identify the penalties from unfavorable weather, so that the risk to a farm operation from unfavorable weather can be evaluated from climatic data. This risk analysis will lead to the selection of the best farm management option for a given climatic area and cropping practice. Of course, modeling pest response from the weather is essential to cost effective and environmental responsible pest management programs.

C. Meteorological research to support the agricultural meteorological system

Because of the nearly total dependence of agriculture on climate and weather, nearly every phase of meteorological research impacts on agriculture. But in the context of these remarks attention will be focused on the research needs in meteorology which either directly impact on the growth processes of plants or are involved in the operation of the agricultural management and/or marketing systems.

The diffusion processes of the lower atmosphere, which transports carbon dioxide into the plant canopy and removes the water vapor, are generally understood; but the application of these processes to a given crop canopy requires adaptation to the local wind and temperature conditions. These local or micrometeorological conditions, are site specific; but they are also related to the large-scale weather and climate conditions. The linkage between the micrometeorological and the circulation features at the scale of synoptic needs study.

Insects and pathogens are transported by air currents. This dispersion of pests by winds requires some definitive research which will lead to the use of dispersion models in pest management techniques.

Every farm management scheme designed to "weatherproof" the agricultural system, such as irrigation, animal shelters, tillage methods, grain drying, et cetera, have capital requirements, energy needs, and operational costs. Methods for studying the economic feasibility and societal advisability of the management options, which alter the weather hazard, are required. The design of methods for risk analysis require inputs from economists and climatologists. This research focuses on some very important issues involving water demands by agriculture, mechanization with the use of fossil fuels in farming, the optimal size of farming units and the environmental integrity of land, water, and air.

DETERRENTS TO AGRICULTURAL METEOROLOGY RESEARCH

A. Data sets

To accomplish the research and development outlined here and to verify the integrity of the models produced from this research both

current and historical data sets are required. First, a biological data set, in which plant growth, development and yields are reported, is urgently needed. Specifically this data set should involve growth measurements (note initiation internode growth, dry matter accumulation, et cetera), dates of phenological events (planting, emergence, floral initiation, fruit set, and maturation) and yields of grain and stover. The second type of data set is climatological data which relate to the biological development in both time and space. This requires the establishment of climatological observing stations at the experimental farms where the biological data sets are being accumulated.

In some cases, assessments of the large-scale impacts of climate variabilities on agricultural production are made using climatic data from a network of cooperative climatic stations. At these stations, maximum and minimum temperatures, rainfall and snow depth are recorded. Traditionally the establishment and maintenance of this network of stations have been the responsibility of the National Weather Service. Agricultural climatologists fear that the quantity and quality of data from this source have declined.

The administration of observational networks is not attractive to the bureaucracy of government (State and Federal) and research institutions (Agricultural Experiment Stations, Research Centers of Agricultural Research, SEA). The instrumentation, observations and maintenance of equipment require money which often does not reflect immediate return. Apparently administrators feel that justification of the support of these networks would fail to attain accountability through audits by Internal Review Committees. Government Accounting Office of the Office of Management and Budget. Somehow a justification for these programs must be made so that the necessary data sets are available to the State and Federal scientists.

B. Leadership in agricultural meteorology

Scientists, both State and Federal, in agricultural meteorology feel frustrated in attempts to compete with the more traditional aspects of agricultural research. The research efforts in agricultural meteorology are fragmented within the organizational structures of the State Agricultural Experiment Stations, Agricultural Research, Economics and Statistics and Cooperatives Service (ECSC) and other research organizations. It appears that a focal point for agricultural meteorological research should be established in the Science and Education Administration, USDA to assist with the coordination and development of research programs by Cooperative Research and Agricultural Research. A similar focal point may be needed within ECSC.

In the long run a National Agricultural Research and Education Center (NAREC) may be required. NAREC would serve the coordination roles described in the previous paragraph and also be involved with the conduct of research projects which are beyond the scope and complexity of the individual research centers in the Agricultural Experiment Stations, Agricultural Research and ESCS. In addition, it would serve Federal extension through the development of an educational program.

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(By Robert S. Chen, Climate Research Board, National Academy of Sciences¹)

I appreciate this opportunity to discuss the importance of climate to decisions in agriculture and other economic sectors. This is a topic about which little is well known, but which nevertheless affects all of us greatly. Let me first review briefly what does seem to be known, and then highlight some of the opportunities and initiatives now available.

The climate is perhaps best viewed as a dynamic global system consisting of the Earth's atmosphere, powered primarily by the Sun's energy, and influenced strongly by the Earth's oceans, ice masses, soils, and organic life. We directly experience this system on a day-to-day, local basis as the particular atmospheric conditions of temperature, humidity, rainfall, windiness, cloudiness, and so on at any point in time and space—that is, the weather. However, the system is further characterized by the longer term, dynamic behavior of the system on regional and global scales. Thus, both the average of conditions and the variability of conditions about this average over periods ranging from days to seasons to decades and over geographic regions characterized by topography, latitude, hydrologic conditions, and so forth are important attributes of the climatic system.

Our knowledge of the climate and its influence on human activities is extremely limited. Of the billions of years of the atmosphere's existence, we have systematic, direct observations for only about 200 years, and then only for a few parameters such as temperature, precipitation, and sea level pressure at a few stations. Indirect evidence provided by tree rings, ice and sediment cores, fossils, lake levels, written records, and a variety of other ingenious natural and human sources give our best look globally at time scales of centuries or millenia. These records tell us that the Earth's climate has indeed changed substantially in the past, both in its average behavior and its variability, and that human activities have throughout recorded history been affected by such changes. However, we do not know much more than this in terms of the mechanisms and modes of climate changes or their impacts. It is important to note here that, unlike many other sciences, there is not now any single, or even leading, theory of climate change which can explain our observations or make reliable predictions into the future. In fact, even short-term, local climatic predictions using continuous local data may be subject to considerable error because of regional or global effects or longer term trends.

Despite this general lack of explicit understanding, many decisions which arise in modern society are greatly influenced by the climate.

¹ This paper is presently in Mr. Chen's personal capacity and does not necessarily represent the views of the Climate Research Board or its parent organizations.

Siting and design decisions for energy and transportation facilities, for urban and rural water supply, waste disposal, and flood protection systems, and for commercial and residential structures are sensitive to a variety of climatic factors. Agricultural planning reflects the influence of climate not only on the growth of crops, but also on the prevalence of fires, pests, and plant diseases and on the costs of food transportation and storage. For an individual, choices of clothing, recreation, and area of residence entail personal decisions concerning climate. All of these decisions implicitly or explicitly involve "taking risks" on climate—that is, dealing with the possibility of adverse consequences in order to obtain some benefit, given uncertain future conditions of weather or climate.

Many ways of dealing with climatic risks are available. Physical measures to prevent or ameliorate adverse climatic effects or to take advantage of climatic opportunities range from the selection of crops for planting to construction and land use requirements for development. Choosing among these requires knowledge of their costs, benefits, and often their social and legal ramifications. Institutional planning and finance mechanisms can facilitate such choices through incentives, trade regulations, quality standards, and so forth. Insurance, for example, not only compensates for losses, but also generally encourages minimization of risks—and thereby insurance premiums. Government usually plays a key role, whether through the establishment of codes and standards, the design of public infrastructure such as dams and sewers, or the provision of disaster relief services. Thus, decisions involving climatic risks often entail extensive consideration of many complex and uncertain alternatives with various social, legal, and political aspects as well as technical and economic ones.

We are increasingly calling upon our understanding of climate to help us deal more effectively with climatic risks. In agriculture, realization of the potential value of climatic knowledge is growing around the world. Many examples can be cited:

A recent commodity research report from Merrill Lynch, Pierce, Fenner & Smith describes in detail the state-of-the-art understanding of "blocking," an as yet unexplained phenomenon of the climatic system with important local implications, and applies this knowledge to predicting agricultural production in the U.S.S.R.

An interactive computer information system in Nebraska and nearby States is providing advice to farmers on the scheduling of irrigations based on climatological data such as evaporation and soil moisture.

The Agency for International Development's Office of Foreign Disaster Assistance operates an early warning program which combines climatic data, weather information, satellite photographs, and other sources to provide advanced warning of potentially abnormal climatic conditions that might impact upon food supplies in developing countries.

Climatological information has been extensively used in the hail insurance industry to help determine potential damage to crops.

Allocation of reservoir water in California watersheds are based in part on actual and mean precipitation levels.

Although efforts such as these are quite exploratory and experimental, they give an inkling of the broad potential of climate information as an input into decisionmaking. However, it is important to point out here that in many cases other nonclimatic factors may also constrain the improvement of decisions. For example, substantial new technical knowledge about plant growth and nutrient use may be needed in combination with climatic information in order to supply advice suitable for agricultural users. The ability to use climatic predictions may be only as great as the ability to enforce the responsible management of resources, as may well be the case in the Peruvian anchovy fishing industry and the distribution of water rights in several Western watersheds. Thus, what will be needed in the future is greater experience in the development, dissemination, and application of usable climate information; increased ability to make such inputs explicitly and systematically in various modes of decisionmaking; and considerable development of not only technical, but also economic, social, political, and institutional mechanisms for responding effectively to climatic risks. Interdisciplinary efforts which directly link current scientific knowledge with policy applications are crucial to progress in these areas. Moreover, the societal contexts and assumptions underlying decisions may have to be reexamined critically in light of changing environmental and social conditions. A few of the areas relevant to agriculture in which some basic questions are likely to arise can be listed:

The influence of climate on major agricultural policy decisions by the United States, other nations, and international organizations such as the Food and Agriculture Organization and the World Bank, with implications for world food security. Third World development, farm income, and so on.

The role of climate in watershed management and the distribution of water rights, involving the planning of such organizations as the U.S. Army Corps of Engineers, the Soil Conservation Service, and the Bureaus of Reclamation and Land Management, the rights of States and other nations, and mechanisms for assigning costs and benefits of climatic risks among various societal units.

The impacts of climate variability and change on fisheries (e.g., cod spawning near Iceland and the anchovies off Peru), their international implications, and questions of the value of predictions.

The influence of climate on plant pests and diseases (e.g., the recent outbreak of grasshoppers in many western States may have been largely due to a series of dry years) and ways of dealing with such indirect effects.

Clearly, we will need much more time and experience before we can deal effectively with such complex and often controversial issues.

OPPORTUNITIES AND INITIATIVES

The national climate program is an effort to come to grips with many different climatic risks and opportunities. The original legislation, the National Climate Program Act of 1978, establishes the pro-

gram to "assist the Nation and the world to understand and respond to natural and man-induced climate processes and their implications." Among the program's key provisions are:

Assessment of the effect of climate on the natural environment, agricultural production, energy supply and demand, land and water resources, transportation, human health, and national security.

Methods for improving climate forecasts on a monthly, seasonal, yearly, and longer basis.

Systems for the management and active dissemination of climatological data, information and assessments, including mechanisms for consultation with current and potential users.

A program for Federal and State cooperative activities in climate studies and advisory services.

A National Climate Program Office has been set up within the National Oceanic and Atmospheric Administration to plan for and administer the program. It has released a preliminary 5-year plan which outlines the program goals and structures.

The Climate Research Board of the National Academy of Sciences has been quite active in assisting the Government in the development of the program. It has concluded two summer workshops to review the Government's plans. The report of the most recent workshop, "A Strategy for the National Climate Program," has just been delivered to the Government and is being published by the Academy. This report proposes a strategy to guide and motivate the efforts of the national climate program. It states:

The national climate program should emphasize early production of useful outputs on the basis of our present understanding of climate, while simultaneously expanding the understanding of climate and its relationship to society.

It suggests three basic types of activities or "streams" which would consist of continuing efforts aimed at improving:

The use of existing climate knowledge for a wide range of users;

Our understanding of both natural and manmade climatic changes and of the potential impacts of such changes on society; and

Our ability to predict climatic fluctuations and to use these predictions effectively.

These "streams" of activities would focus on three major program areas or "themes," considered important to the national welfare; the areas of energy, food, and water resources seemed most appropriate. Thus, the strategy would guide planning for the national climate program toward the development and application of climatic knowledge in areas of considerable national concern. It would lay the foundation for continuing dialog between researchers, users, and Government.

The workshop report also strongly supports the development of an active intergovernmental program as called for in the legislation to aid delivery of climate services at a local level and to communicate local needs back to the Federal Government. The role of the Federal Government would be in part to help demonstrate the needs for and potential of such a program by initiating demonstration projects and

by pulling together existing, but scattered, climate-related services now provided by State climatologists, agricultural extension units, universities, and others. Support for this program is needed from all users and throughout local, State, and Federal Government.

In addition to advising the Government on the national climate program, the Climate Research Board is also taking an active role. For example, its Panel on the Effective Use of Climate Information in Decisionmaking, chaired by Dr. Sytan Wittwer, of Michigan State University's Agricultural Experiment Station, is conducting several case studies of the ways in which climatic knowledge can improve the management of agricultural, water, and energy resources. The Panel is also assisting the Center for Advanced Engineering Study of the Massachusetts Institute of Technology in convening a conference on "Climate and Risk." This conference, scheduled for May 27-29, 1980, here in Washington, D.C., will bring together representatives from industry, Government, and academia from all across the country to discuss actual cases in which climatic knowledge has aided major decisions. It will focus specifically on the three main themes of energy, food, and water resources. Among the topics related to agriculture which will be discussed are:

The use of climatic data to schedule irrigations;

Acreage set-aside decisions by the U.S. Department of Agriculture;

Snow management;

Agricultural drought assessment; and

Adaptation of western water rights systems to climate variability.

We anticipate that this conference will be a substantive and timely contribution to the general topic of climate and decisionmaking.

In the international arena, the World Meteorological Organization has established a world climate program with many of the same objectives and goals as the U.S. national climate program. The National Climate Program Office and the Climate Research Board expect that the United States will make substantial contributions to the global program and will assist in the coordination of research and applications worldwide. Some of the opportunities under discussion are:

An international climate data referral and exchange system;

Global monitoring efforts, including ocean monitoring;

A global carbon dioxide effort; and

International efforts in research on global biogeochemical cycles.

These international activities should provide substantial knowledge about the global climatic system and its relationship to human activities throughout the world.

In conclusion, I would like to reiterate my belief in the potential value of improved understanding of climate for aiding our management of resources. Yet for such potential to be realized fully, we will have to improve simultaneously our understanding of related technical, economic, and social areas and of decisionmaking processes, as well as our ability to respond effectively to this knowledge. Although many current activities and initiatives, of which I have mentioned only a few, are excellent first steps in this direction, continued efforts and support will be needed. But the results should be well worth the investment.

WEATHER AND PRODUCTION PROSPECTS—1980

(By R. E. Felch, Agricultural Weather Analyst, World Food and Agricultural Outlook and Situation Board, U.S. Department of Agriculture)

The events of the past several months have served as excellent reminders of the importance of weather conditions in determining agricultural production. While the United States has been blessed with another bumper crop, many parts of the world have not been as fortunate. The Indian monsoon was erratic most of the season and has heavily impacted production for the current crop and produced rather poor prospects for the winter wheat crop which should be planted. The European sector of the U.S.S.R. and parts of Eastern Europe were short of moisture during critical parts of the growing season, and in some areas, were too wet during harvest.

Reflecting on previous efforts to look ahead to the coming season in previous Outlook conferences, one also realizes the many weaknesses in trying to make such statements. However, the weather events in recent weeks and months have set a stage which the developments of the next several months must build on. This is particularly true for the northern producing areas where winter has already made its presence known. Soil moisture conditions will change very little in these areas between now and next spring.

Soil moisture is a key element in determining production prospects. Outside of the United States, judgments must be very qualitative. However, the use of the Palmer Index in the United States does provide a basis for more quantitative evaluation.

THE UNITED STATES

The latest Palmer Index map is shown in figure 1. This index was designed to provide a means for evaluating the scope, severity, and frequency of prolonged periods of abnormally wet or dry weather. It is not always an indication of the current moisture situation relative to water requirements of the plants, but it does provide an excellent measure of the overall soil moisture picture. It essentially shows the overall "hydrologic" picture which is very important for longer term planning. This index is also useful because it does integrate the weather conditions over several weeks and months. Positive values of the index indicate that the moisture supply, measured in terms of soil moisture, is greater than normal. Similarly, negative values indicate areas where conditions are drier than normal.

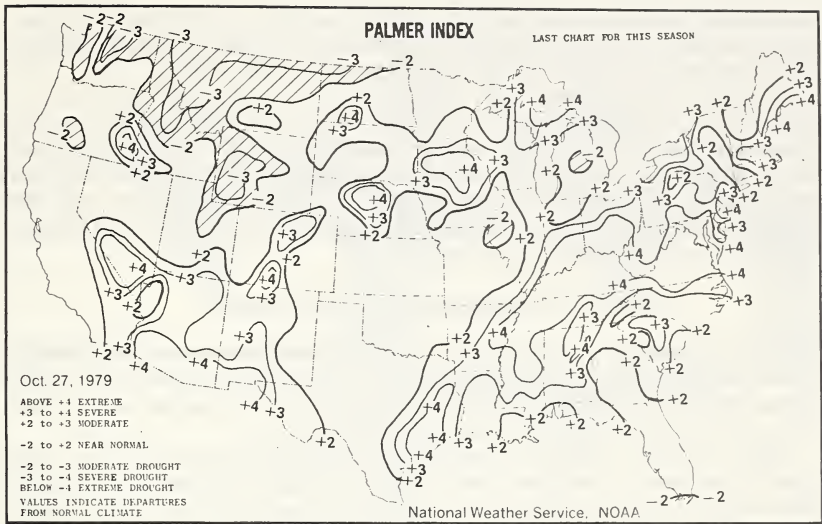


FIGURE 1. The Palmer Index map for the United States as of October 27, 1979.

Moisture conditions across the United States at this time are generally wetter than normal except in the central Great Plains, which are near normal, and the northern Rockies where conditions are considerably drier than normal. The very dry areas of the Southeast which persisted last year are now very wet as a result of heavy tropical storm activity in September. Good rainfall amounts over the central and southern Great Plains the past several days has most likely pushed soil moisture to levels somewhat higher than normal.

Winter wheat: Conditions in the major wheat producing areas of the United States are generally as wet or wetter than a year ago. In the Great Plains there were delays in seeding because of dryness in the surface soils and germination was delayed, particularly in southwestern production areas. Most of Kansas, Nebraska, received almost twice their normal precipitation in October, much of it in a major storm the last week of the month. Central Oklahoma received only about half its normal moisture.

In general, there appears to be good moisture for the winter months over most of the Great Plains. The risks of soil blowing are less than a year ago, although they are an ever present feature of the climate of the Great Plains.

In the Pacific Northwest, winter grains are in generally good condition with normal to well above normal moisture in October. The rainy season started somewhat early this year and conditions are favorable.

Spring wheat: Soil moisture conditions in North Dakota and Montana are drier than normal and considerably drier than last year. Rainfall and snow totals were only about 25 percent of normal during October. Good rains in the spring will be very important for seeding next May.

The Corn Belt: The Corn Belt continues to be very wet except for portions of central Illinois. Unlike last year, when conditions for

harvesting both corn and soybeans were excellent everywhere, the western Corn Belt has been plagued by persistent rainfall. Iowa and Minnesota corn growers are experiencing the most difficulty.

Looking ahead, conditions will likely be on the wet side as soils warm up next spring. April rainfall will be the real key to how the planting will develop. Near normal moisture in the western Corn Belt could result in some problems with wetness because of the full soil moisture profiles which already exist. The late corn harvest will also prevent a full complement of fall plowing which means that additional fieldwork will be required in the spring.

THE INTERNATIONAL SITUATION

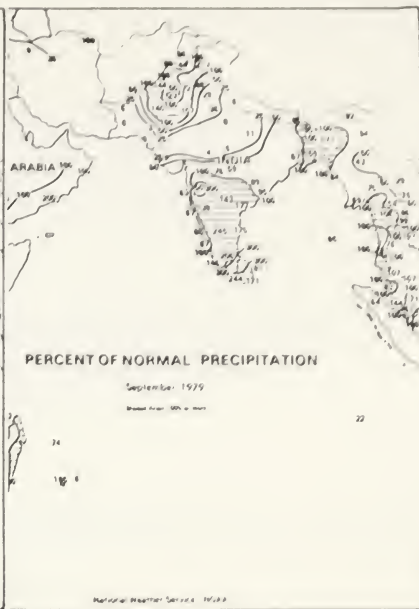
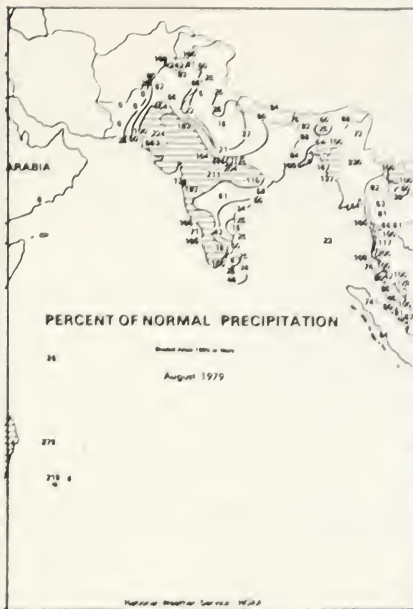
It is impossible to consider all the world in this session, but it would be useful to key on a few critical areas. They reflect in part some of the areas which the USDA/NOAA joint agricultural weather facility will be monitoring closely in the coming months.

The U.S.S.R.: Western portions of the Soviet winter grains areas has experienced conditions very similar to our western Great Plains where early dryness during the planting season caused some delays and likely poor germination. In the past several days, extremely cold weather has moved into the Ukraine, possibly record cold. Winter grains in this region will be very susceptible to damage this winter because of poor development, although this particular cold outbreak may have not actually damaged the young crop. Winter grains in the western Ukraine are likely in much better condition.

China: A year ago, China was faced with extremely dry conditions in many production areas. However, they have benefited from excellent moisture throughout the growing season this year and water supplies for the winter and next summer should be in excellent condition. Winter grains should be in good condition with ample irrigation water.

India: The Indian monsoon was erratic throughout the summer months and production prospects for this year have dropped sharply. The rainfall, expressed as percent of normal is shown in the figure below for the months of August and September. The impact of these deficiencies will be felt for months to come as the winter wheat crop is somewhat dependent upon antecedent soil moisture from the monsoon season. Irrigation water will have to be increased, but diesel fuel supplies to run the irrigation pumps are short.

Brazil/Argentina: Close attention will be paid to this region as the winter grain harvest proceeds along with the planting of corn and soybeans. Very heavy rains in Rio Grande do Sul, Brazil just prior to harvest greatly reduced production prospects. Soybean planting is underway with good soil moisture conditions in Parana and excessive moisture in Rio Grande do Sul.



OUTLOOK FOR FAMILY LIVING

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THE INFLUENCE ON FAMILIES OF THE WORLD ECONOMIC SITUATION

(By Clark Edwards, EDD, ESCS, U.S. Department of Agriculture)

The price of gold is sky high and the value of the dollar in world markets is off. So what. Are such remote events of any concern to a farm family busy getting in the crops, feeding the livestock, and trying to balance the checkbook? In a way, the answer is no. A family can keep busy and happy for years without worrying about such matters. That is, some families can—but can all of us? The repercussions plague many of us in the form of higher prices for farm supplies and consumer goods through inflation, in the form of declining markets for farm and rural products through unemployment and recession, and in the form of higher interest rates.

The United States is getting more and more intricately involved in world trade and international finance, not less. The world market for U.S. farm products grew sharply during the 1970's. These and other exports provide us with foreign exchange to buy petroleum, take vacations abroad, and acquire other imports. It is not likely that we will become isolated again—nor is it in our best interests that we should. When our international exchanges are working right, the influence on families is generally beneficial. The high price of gold and the low price of the dollar are symptoms that something has gone wrong; the influence on families can be adverse.

Why do we engage in foreign trade? Wouldn't it be better to consume only what we produce ourselves—to become completely self-reliant? We could do that, of course, but to do so we would have to reduce our consumption. One of the reasons is obvious: We import tea from India and bananas from Central America that we cannot raise at home. If we want these things, we must import them. And, if we import them, we must export something—goods, services, or gold—to pay for them.

The second reason we engage in foreign trade is less obvious but more important: When we exchange American grain for Japanese cars and TV's, the output of both countries is larger than if there were no exchange. The same effect is gained within a large country like ours when textiles produced in the South are exchanged for grain and livestock products produced in the Midwest. Unlike the tea and banana examples, it is feasible for the United States to produce more cars and TV's and for the Japanese to produce more grain. By our specializing relatively more in one and they in the other, we produce more of both and improve the incomes in both countries. This is called, by economists, the principle of comparative advantage.

The idea of comparative advantage has dominated much of the thinking about world trade over the past two centuries. It was used to

advocate policies of free trade among nations for mutual advantage. There were many gains from free trade, to be sure; however, the doctrine did not work as calculated. Trade makes one country dependent on another. In happy times, such dependencies were all right, but during economic or military wars, the dependence was a source of vulnerability. So countries protected themselves by producing, say, steel at home, even when it could be imported at lower cost. Further, protection was needed in a world of a few powerful trading blocs because some trading partners were willing and able to use their monopoly power to take advantage of others.

But there was another and more difficult problem with free trade; it resulted in unstable domestic economies and it changed the international distribution of income. If a nation exported more than it imported, the difference might be made up by importing gold. This would increase the domestic money supply and decrease the foreign supply. A result was likely to be inflation at home and deflation abroad. Higher prices at home hurt the export market; lower prices of foreign goods induced more imports. These changes could lead to a drain of gold because of an unfavorable balance of trade. In this way, an attempt at free trade by one country could induce alternate periods of boom and bust—of inflation and recession. This may have resulted in economic efficiency in the long run, but in the short run it was ruthless in the way economic adjustments were forced on families; it was a source of hardship and of poverty. For example, firms that came into existence when export markets were expanding might go bankrupt when such markets declined. During declines, workers might lose their jobs and young people might find it difficult to enter the labor market.

The search for stability and equity led to protection. Free trade never actually existed, but as national policy it was replaced by import and export quotas, taxes and subsidies, fixed exchange rates, and proscribed spheres of influence. Because of such policies, for the past several decades the goal of stability was approximated. However, protection of one country was often at the expense of another. Affected countries were likely to retaliate with their own protective strategies. Some nations may have gained in a relative sense although, from the principle of comparative advantage, the world as a whole may not have attained the level of income that it might have had had there actually been free trade.

The efforts to channel international flows of goods and money misdirected some flows in the sense that some countries had persistent drains in gold and other forms of exchange, while other countries accumulated these financial resources. These imbalances led to a breakdown, a few years ago, in the carefully contrived system. We now have a more volatile arrangement which is neither fully free nor fully regulated. We have more flexibility of adjustment from some sources, such as flexible exchange rates and variable levies, but we have possibly less from other sources, such as inspections, health regulations, and other nontariff barriers to trade. Consequently, the international flows of goods and money are subject to considerable instability, yet the changes are not necessarily toward economic equilibrium.

International flows of money depend only in part on imports and exports. Perhaps more important in recent years are the flows of funds

associated with investments, loans, aid, and military activity. For many years, the United States ran a negative balance of payments despite a positive balance of trade because of heavy capital outflows for various public and private purposes, including business investments in foreign countries and the Marshall plan. Currently, we are running negative on both the trade and the capital accounts. This imbalance is causing problems with both the domestic and the international money supply.

Before we see why this is so, let us digress to examine what money is. Consider the functions of money. As a medium of exchange, money facilitates trade compared to the awkwardness of a barter system. As a unit of account, money tells who owes what to whom. Money is an asset to the one who holds it, but, by the same token, it is a liability of the economic system to the holder. If you have a dollar, you are entitled to a dollar's worth of merchandise from the economic system. When you work, you receive credits in the form of dollars which can be exchanged at another time and place for things you want. It is part of the same accounting system to buy on credit, only now you owe the economy something to be repaid at another time and place. If you borrow \$1,000 at your local bank and put it in your checking account, the Nation's money supply grows by \$1,000 because demand deposits are considered part of the money supply. The quantity of money changes with and depends on the level of debt. The use of money as an accounting mechanism keeps the social system straight as to who owes what to whom.

As a store of value, money separates in time and place the two sides of a transaction. Instead of bartering, say, one cow for two pigs, I exchange the cow for money here, today, and use the money as a store of value until I am ready to buy the two pigs, perhaps another day in another town. Many commodities serve as a store of value. Gold, silver, and copper have long had this use. But we can also use tobacco, wheat, land, or automobiles, as a place to store our wealth. The more rapid the rate of inflation, the more important land and commodities become as a place to store wealth as an alternative to holding currency or bank deposits. It is the search for a safe place to store wealth that is driving up the price of gold. It is a symptom that people are seeking alternatives to the conventional money supply.

Now that we see that the quantity of money—defined as currency and demand deposits—depends on debt, that money facilitates exchange, that money performs an accounting function of who owes what to whom, and that money is only one place to store wealth—and in inflationary times, not a very good place—let us return to the monetary crises associated with continued and heavy imbalances in the international flows of money.

The U.S. international transactions have tended toward a positive balance of trade—except for the last 2 years—on the basis of our usual accounting methods. But, with heavy net capital outflows, we have tended toward a negative balance of payments. A century earlier, this negative balance probably would have been covered by gold outflows. We have used gold for that purpose in recent times, but there are other ways to balance our debts to the rest of the world. Let me mention two of them. First, we can write checks which can be de-

posited in foreign banks. Second, we can send over securities, such as U.S. Government bonds. Both the deposits and bonds represent United States debt to foreigners.

Foreign banks can use our IOU's as reserves against which to make loans and to create money just as we can. When we transfer demand deposits and Government bonds to foreigners, we reduce our money supply as they increase theirs. In this way, the capital drain in our balance of payments can lead to expansion in the money supply in other countries based on United States debt. The so-called Eurodollars are created out of the float of United States debt circulating abroad and not yet settled.

For a long time, money based on private and public debt by the United States was considered abroad to be a convenient medium of exchange, a useful unit of account, and a safe store of value. That was before there was so much of it, before the present inflationary pressures, and before several developed nations recovered from World War II. Now, United States debt underlies a significant portion of the world money supply and the simple laws of supply and demand suggest that growth in the quantity should be expected to weaken the price.

When, on top of that, you consider that inflation is causing all money to be less important as a store of value, the pressures on the dollar intensify. People are giving up dollars and other currencies to hold gold and other commodities, including land, where they think their wealth is better protected against inflation and recession. Thus, the high price of gold and the low value of the dollar in international trade are symptoms of imbalances in the international flows of goods and money—imbalances that have been widening rather than narrowing in recent years.

The international monetary situation is, of course, more complicated than the simple story told here. But this story portrays a part of the problem. And understanding the problem in this way suggests certain things we can do to ease the international monetary crisis.

Inflation at home aggravates the problem. Higher prices at home make our exports less competitive in world markets; they stimulate the use of commodities and other investments as a store of value instead of money. It would help to slow down inflation, which is part cause and part effect of the international monetary crisis.

Rising consumer expenditures, stimulated by economic growth at home, tend to raise imports relative to exports, which makes the balance-of-payments situation worse. This suggests that a recession at home would ease the international monetary crisis by reducing imports. But it would cause problems of unemployment and poverty. So we want to reject this strategy if we can.

Low interest rates at home fan the problem because domestic capital will fly to other countries where interest rates are higher. However, high interest rates at home, maintained to avoid a drain on U.S. capital have unintended side effects. High rates cause cost-push inflation on the one hand and reduced investment with possible unemployment on the other. Policies which ease the international problem can cause other and more difficult problems at home.

Recession and high interest rates may be good for the international situation, but they are not what we want for the domestic situation.

There must be some other way. If we wait for other countries to take the lead, we must hope, for our own benefit, that they will seek more real growth—which they would like and which would expand markets for our exports—plus more inflation and higher interest rates—which they might not like but which would reduce our imports and allow us to maintain high interest rates without spurring a drain on capital. To hope for that is wishful thinking.

Devaluation helps by treating the symptoms. It makes our exports more attractive in world markets, and it reduces our propensity to import. So the pressures from a negative balance of payments are eased. But devaluation by a country heavily involved in world trade can have adverse effects on other countries. If the causes of the negative balance are not treated, the initial problem will return and the beneficial effects will prove to have been temporary.

Each of the above policies clearly presents difficulties. Any single strategy is likely to help one aspect of the problem but worsen other aspects. So we have to look at several strategies operated together. The several strategies we have tended to follow over the past decade to deal with domestic and foreign macroeconomic problems are these: We have run large and inflationary Government deficits at home and negative balances of payments abroad; we have used tight money and high interest rates to fight inflation and ward off the dollar drain. Yet, while these policies have been in place, we have continued to experience a dollar drain, pressure on gold prices, rapid inflation, and high unemployment.

An alternative is to reverse some of our strategies. For example, we could raise taxes and/or reduce Government spending to ease the inflationary pressures that come from excess demand. We could then increase the money supply in order to lower interest rates, induce private investment, and maintain full employment. The loophole here is that low interest rates at home relative to abroad would induce a capital drain; something is needed to prevent this. The dollar drain could be limited, for example, by a capital export tax such as we had during the early 1970's.

It is true that the international monetary crisis is more complicated than I have presented it here. But it is also true that the view I have outlined points to economic policies that are quite different from what has actually been done during the past decade. Families generally gain from a national economic situation of steady growth, stable prices, and full employment. International trade and related flows of money in international markets play an increasingly important role in attaining these gains. Since we, as members of families, are influenced by changes in the world economic situation, we need to try to understand what caused it and how to change it, even though the actions required are not ones we can take as individuals. It is time to think the matter through again.

FAMILY ADJUSTMENTS IN FINANCIAL MANAGEMENT

(By M. Janice Hogan, Associate Professor of Family Social Science, College of Home Economics, University of Minnesota)

The decade of the eighties marks the beginning of an era of critical adjustments in financial management for many U.S. families. The consumer price spiral and the spot shortages of energy have again and again signaled the attention of families. We are ending the 1970's with new perceptions of economic scarcity and a growing awareness that our energy-intensive consumption patterns are too expensive to maintain.

Socialized as American families have been to the belief that there is an endless supply of material and energy supplies, it has been difficult for many to seriously consider values encompassing conservation. However, as the balance between income and expenditures is disturbed and as families face significantly higher fuel bills as well as larger pricetags for other consumer goods, they will find new wisdom in the values of conservation, frugality, and ecoconsciousness, that is, an ecological orientation.

In general, the adjustments that families may make in their financial management include: (1) Rescaling or changing the level of consumption, (2) increasing the efficiency of the resource use, and/or (3) expanding their income. Each of these potential adjustments will be discussed. However, it should be noted that adjustment options will not be feasible in some families. For example, those families experiencing unemployment, divorce, health disabilities, and other crises may have little or no viable alternatives for adjustment in the near future. Also, financial adjustments will be constrained in those families who have already adopted a frugal pattern of consumption and live on a fixed income. Special programs and funds for special needs will continue to be needed for families with little or no options for financial adjustments.

ADJUSTMENT: RESCALING CONSUMPTION PATTERNS

The news releases about jumps in consumer prices have become regular household messages. In August, the Consumer Price Index [CPI] rose about 1 percent for the seventh consecutive month. The double-digit inflation rate, in part, reflects the cost of maintaining our energy-intensive lifestyle.

Over the years, increased energy has been used to fuel the family vehicle(s) and heat and cool the family home(s). These direct uses of energy are very familiar since they are the target of most conservation programs. The increase in the price of utility—piped—gas, fuel oil, electricity, and gasoline has been dramatic. Based on the June 1979 date reported by the Department of Labor—September 1979—the

cost of fuel oil has increased most, followed by utility gas, gasoline, and electricity. Fuel oil was indexed at 406, which meant that it took \$406 to purchase fuel oil last June that sold for \$100 in 1967; utility gas was indexed at 302, gasoline at 265, and electricity at 224—Table 1.

The cost of fuel varies across the country (table 2). For example, last August utility gas per 100 therms sold for \$32.13 in the Minneapolis-St. Paul area and \$49.53 in the New York City area. Electricity sold for \$9.45 in the Seattle area in contrast to \$30.48 in Chicago and \$46.72 in the New York City area. Fuel oil is not used as a major heating fuel in some cities and the price differences are relatively minor from one city to another. It should be noted that rural families are more likely to heat with fuel oil, propane gas, and electricity than with the less expensive utility (piped) gas.

While the increases in the price of utility gas, fuel oil, electricity, and gasoline have been sizable, direct energy is a relatively small item in the average consumer budget. The Department of Labor estimated last December that about 4 percent of the average urban consumer's annual expenditures are for fuels to heat-cool the home and another 4 percent of their expenditures are allocated to gasoline for private transportation [see table 1]. It should be noted that during the months of extreme temperatures, and in families with less than average income, the cost of heating or cooling the home is a much higher percent of the families' monthly income. For example, in a study of families in the Twin Cities area, some lower income families were spending about 8 percent of their after-tax income for utility gas; families heating with fuel oil would pay about twice as much from their budget.

Consumers are less aware of the energy that is used to produce the goods they buy, that is, indirect energy. Studies have found that the higher the income, the greater the consumption of indirect energy. For example, energy is required for manufacturing material goods such as microwave ovens, trash compactors, electric burger cookers, electric crepe sets, and stereo equipment. While most household appliances do not require large amounts of energy to operate, they do require a great deal of energy for manufacturing and distribution. Easy care fabrics, convenience foods, and throwaway goods—such as styrofoam cups, paper towels, and disposable diapers—have diminished the amount of human energy (household labor) required. In exchange, we have increased the amount of fossil-fuel-based energy used for producing these timesavers. Indirect energy accounts for over half the energy the average family consumes.

Consumer expenditures for consumer goods have expanded year after year. The motivation for buying the litany of new appliances and household equipment does not appear to be closely linked to increased efficiency in household work but rather to satisfaction attributed to an accumulation of goods.

While automatic washers, clothesdryers, dishwashers, garbage disposals, snowblowers, and other machines could decrease the amount of time and human energy needed for housework, families have offset some of the gains by changing their standards of good living. For example, clothing is laundered more frequently because bathing is more frequent because there are larger water heaters with instant heat

recovery and automatic laundry equipment. Also, we have continued to build larger homes with multiple bathrooms, creating more space to maintain; also these homes have tended to be built in the suburbs so traveltime increases to. The utility bills and gasoline expenditures reflect the change in standards.

Rescaling consumption patterns with a focus on reducing the consumer demand for energy is not easy. Energy-related decisions are present in just about everything we do. Family decisions to conserve energy directly include: The temperature of their home, the payoff for retrofitting (insulating, caulking, storm windows, etc.), automobile use, cleanliness standards for laundry and bathing, cooking style and efficient use of appliances. Indirect decisions include: The choice of housing (size, location, single or multiple-attached dwelling, etc.), the choice of automobile (number, size, options, energy efficiency), the life-cycle cost of appliances, type of clothing, choice of foods, vacations and recreation equipment, and gifts.

Readjusting consumption patterns are easier for some U.S. families, especially those who started implementing conservation behavior as a response to rising energy prices and found it a satisfying challenge. In the Twin Cities year-long study of how families were adjusting to rising energy prices, families in both lower and upper income groups exhibited this attitude.¹ However, there was also a minority of families who were resisting conservation and were blaming Government and industry for a "contrived" scarcity. Some families believed that the shortages were short term and were trying out conservation behavior to cope with escalating prices and shortages. Still another type of behavior exhibited was that of verbalizing conservation while attempting to buy their way out of the situation by "adding-on" commodities such as microwave ovens or a small car.

The issues involved in changing consumption patterns will be debated more fully in the coming years. The ever-increasing consumption of energy and material goods has been viewed as a measure of success by some families, as a right of being an American by others. Is there a difference between "wants" marketed by our economic system and "wants" taught by parents, teachers, and clergy? Are family wants for consumer goods insatiable? Can we distinguish between needs and wants? Can we improve the quality of living by scaling down the consumption of selected consumer goods? How will the market respond to changing consumer demand? How much family members rescale their consumption and how they choose to substitute human skills for fossil fuel energy are strategic choices in the decade of the eighties.

ADJUSTMENT: RESOURCE EFFICIENCY AND INTERDEPENDENCE

Increasing the efficiency of resource use can include repairing rather than replacing consumer goods, comparison shopping to buy goods,

¹ The study is of 40 families, equal numbers in lower and upper income levels; they were matched for family composition and age of dwelling. Data was collected in 1977-78. Refer to the University of Minnesota, Agricultural Experiment Station, Minnesota Science, vol. 34, winter 1979, pp. 4-6.

and reducing the amount of waste. Reduction of waste is an adjustment that most U.S. families could implement with a financial payoff.

A study of Tucson, Arizona families garbage by Harrison, and others, (1975) revealed 9,500 tons of edible food was thrown out annually. Among those 9,500 tons of garbage were \$570,000 worth of beef, \$1,326,000 worth of vegetables, and \$570,000 worth of pastries. Families may find that they can make better food shopping decisions if they are committed to minimizing the edible food wasted.

Growth in self-reliance can also contribute to resource efficiency. In a study of how families were coping with inflation and recession in 1976, Caplovitz (1979) reported that about half were repairing goods that they used to throw away and about 40 percent had discovered unused talent that they did not know they had, like fixing things themselves. Only 28 percent of the approximately 2,000 respondents showed no sign of increased self-reliance.

The adjustment of consumption patterns in the family, in part, rests upon a consensus of values. While the family does not have one unified set of attitudes that commits each of its members to think and act alike, a network of common values will be necessary for adjustment plans to be successful. For example, conflict may be brought about by rising gasoline prices and the curtailment of some family member's use of the automobile. Decisions about changing the thermostat as utility bills mandate a larger share of the family's income may also create tension, especially if family members have strong temperature preferences. The allocation of money for insulation versus high utility bills may also be a difficult decision for families who are also considering a move in the near future. Finally, the issue of which family members will increase their labor in the household as a substitute for energy-intensive activities will be on the agenda of some families.

Sharing of resources requires mediating family differences; diverse values may result in conflict, active dissent or opposition. To minimize the need to share, some families have worked toward independent consumption patterns. They have multiple cars, television sets, hair dryers, and other durable goods and homes with multiple bathrooms. To shift to an interdependent consumption pattern, one with increased sharing of resources, will require a basic change in values. Perhaps the most difficult adjustment that some family members have is the sharing of scarce resources with other family members.

Sharing resources within the family, with neighbors, and with others can take the form of car pooling, old-fashioned social activities, or using the school to organize classes in parenting skills. Are the happiest, healthiest, and best adjusted persons likely to be living in families and communities that consume the most or share the most? In the United States we use double the energy that is consumed in most European countries. Are we twice as happy?

ADJUSTMENT: EXPANDING FAMILY INCOME

It is expected that as the cost of living increases, families will attempt to increase their income. In the Caplovitz study (1979), respondents were asked if they were combating rising prices by

increasing income through the following strategies: the chief wage earner had taken a second job, had worked more overtime, and whether an additional member of the family was in the labor force. Only 4 percent held two jobs, 26 percent worked more overtime, and 16 percent reported having an additional member of the family enter the labor force. In sum, 38 percent were engaged in expanding income using one of the three strategies; conversely, 62 percent were not engaged in this type of income expansion.

The two-earner family trend will likely continue in the decade of the eighties. According to 1978 labor market reports, both spouses were earners in half of all husband-wife families (Johnson, 1979). The rate of employment among wives who have children under 18 has grown during the seventies, from 40 percent in 1970 to 50 percent in 1978.

With more wives in the labor market, the pressure to buy consumer goods and services as a tradeoff for her labor in the household and the pressure on other family members to share the labor at home has increased. Data indicate that employed women have continued to reduce the number of hours they spend in household tasks, from 26 hours in 1965 to 21 hours in 1975 (Robinson, 1977). However, data from the same study indicate that there has not been a reciprocal shift by other family members in household labor. Robinson reported that husbands increased their time used for household work from 9 hours to 10 hours per week over the 10-year period. Although the change in the division of labor is not commensurate with the gap created by the wife's move into the labor market, the trend is in the right direction.

In comparison to dual earner families, single-parent families have little income expanding potential. Most of the single-parent families are headed by females, women have continued to have less earning power (Johnson, 1979). Of the more than 10 million children under 18 who live in single-parent families, 92 percent live in female-headed homes; if you focus on the children under 6 years, 95 percent live in female-headed homes.

SUMMARY

Today's management patterns are increasingly complex. They involve resource conservation, development of new patterns of consumption, more equitable participation of family members in household and labor market work, and a better understanding of the ecological system in which we live. The tradeoffs that families make will involve choices between retrofitting and high utility bills, between using disposable diapers versus increased laundry and between buying another car and riding the bus. Also, they involve choices about fairness in sharing scarce resources.

Families will be challenged to examine the values that underlie their consumption patterns and to develop new solutions for improving their quality of family life. Adjustments in financial management based on sharing and cooperation, a renewed commitment to conservation, and simplicity of lifestyle are recommended.

TABLE 1.—CONSUMER PRICE INDEX FOR ALL URBAN CONSUMERS, U.S. CITY AVERAGE
[1967=100]

Group	Relative importance, December 1978 (percent)	June 1978	June 1979
All items.....	100	195	217
Food and beverages.....	19	209	229
Food.....	18	214	235
Food at home.....	13	214	234
Food away from home.....	6	218	243
Alcoholic beverages.....	1	160	172
Housing.....	44	202	226
Shelter.....	30	209	237
Rent.....	6	164	175
Homeownership.....	24	225	259
Home purchase.....	10	195	221
Financing, taxes and insurance.....	10	255	302
Maintenance, repairs.....	4	232	256
Fuel and other utilities.....	6	218	239
Fuels.....	4	250	286
Fuel oil, coal, bottled gas.....	1	295	391
Fuel oil.....	1	293	406
Gas (piped) and electricity.....	3	237	260
Utility (piped) gas.....	1	262	302
Electricity.....	1	210	224
Other utilities and public services.....	2	158	159
Household furnishings and operation.....	8	178	190
House furnishings.....	4	154	163
Housekeeping supplies.....	2	206	222
Housekeeping services.....	2	226	248
Apparel and upkeep.....	5	160	166
Transportation.....	18	186	213
Private transportation.....	17	185	213
Gasoline.....	4	194	255
Public transportation.....	1	187	194
Medical care.....	5	218	238
Entertainment.....	4	176	188
Other goods and services.....	4	181	195
Tobacco products.....	1	175	186
Personal care.....	2	181	195
Personal and educational expenses.....	1	194	209

TABLE 2.—AVERAGE PRICES FOR UTILITY PIPED GAS, ELECTRICITY, AND FUEL OIL NO. 2; AUGUST 1979

	Utility piped gas per 100 thm	Electricity per 500 kWh	Fuel oil No. 2 per gal
U.S. city average ¹	\$32.65	\$26.37	\$0.80
Chicago, Ill.—Northwestern, Ind.....	33.56	30.48	.79
Detroit, Mich.....	31.40	28.78	.79
Los Angeles—Long Beach, Anaheim, Calif.....	26.28	25.03	(²)
New York, N.Y.—Northeastern New Jersey.....	49.53	46.72	.81
Philadelphia, Pa.—New Jersey.....	38.47	25.95	.72
Anchorage, Alaska.....	20.18	20.55	.78
Baltimore, Md.....	34.78	24.19	.74
Boston, Mass.....	41.37	27.98	.80
Cincinnati, Ohio—Kentucky—Indiana.....	28.77	22.39	.80
Denver—Boulder, Colo.....	28.34	24.66	(²)
Miami, Fla.....	36.08	27.85	(²)
Milwaukee, Wis.....	32.92	28.55	.80
Northeast, Pa.....	37.14	24.29	.77
Portland, Oreg.—Washington.....	39.74	14.62	.80
St. Louis, Mo.—Illinois.....	32.06	23.98	(²)
San Diego, Calif.....	30.94	28.75	(²)
Seattle—Everett, Wash.....	37.30	9.45	.80
Washington, D.C.—Maryland—Virginia.....	38.83	26.72	.84
Atlanta, Ga.....	31.60	21.70	(²)
Buffalo, N.Y.....	39.92	24.40	.86
Cleveland, Ohio.....	28.61	31.13	(²)
Dallas—Fort Worth, Tex.....	26.18	23.71	(²)
Honolulu, Hawaii ²	106.25	30.58	(²)
Houston, Tex.....	31.46	24.13	(²)
Kansas City, Mo.—Kans.....	22.58	32.30	(²)
Minneapolis—St. Paul, Minn.—Wisconsin.....	32.13	25.22	.80
Pittsburgh, Pa.....	26.80	26.62	(²)
San Francisco—Oakland, Calif.....	30.34	18.24	(²)

¹ Honolulu not included for utility (piped) gas.² Prices are for propane only.³ Not available.

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FAMILY SAVINGS: ANOTHER VICTIM OF INFLATION

(By Colien Hefferan, Family Economist, Science and Education Administration,
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TRENDS IN SAVINGS

During the last decade the average rate of household saving has been relatively stable at the 6-percent level but during the past year has diminished to less than 6 percent of disposable income.¹ Economists are mixed in their opinions of whether the recent decline in the saving rate is indicative of future trends or merely a shortrun adjustment to changing economic conditions. It is certain, however, that households are saving a smaller percentage of their disposable income than they have in the past and that a number of economic and social conditions such as price changes, Federal and State regulations of financial instruments, population trends, and family characteristics seem to be associated with this change.

Household saving rates are of concern to economists and home economists alike. For the economist, a change in the rate of household saving may signal a change in the rate of capital formation, economic expansion, or productivity gains. Also, the household saving rate may be an indicator of the overall efficiency of the economic system. For the home economist, a change in the rate of household saving may foretell a change in families' abilities to achieve their financial goals, enter or exit the housing market, or attain a sense of economic well-being. These concerns are closely interrelated. When the rate of economic expansion alters in response to household saving, the economic opportunities for household members may also alter. New job opportunities and advancement, product prices and availability, interest rates, and the supply of credit may all be influenced by the rate of household saving. In turn, these factors influence households' ability to save. What begins as a response to shortrun economic conditions can become a self-propelling determinant of the longrun economic climate.

Prices.—The circumstances most often cited as related to changing rates of household saving is the overall level of prices. Theoretical and empirical work during the early and mid-1970's generally supported the notion that an increase in the general level of prices results in an increase in the rate of household saving [6, 5, and 4,] and that these price increases have both a direct and indirect effect on savings be-

¹ Measured in the University of Michigan's Survey Research Center's (SRC) Index of Consumer Confidence [8].

havior. The direct effect is to increase uncertainty, thus increasing the perceived need to save, and the indirect effect is to reduce the real value of currently held financial assets, thus further increasing the perceived need to save. In other words, these findings suggest strong evidence of the positive effect of increased price levels on the rate of household saving.

Our experience during 1979—the decline of the savings rate during a period of rising prices—appears to have contradicted this established relationship. Or has it? It may well be that an increased level of prices in and of itself does not generate the actual need on the part of households to increase their rate of saving. Rather, it is the uncertainty generated by increasing prices that increases the perceived need to save, and at the point at which price increases become somewhat expected the perceived need to save current income may somewhat diminish. Also, as price increases become more certain, the real value of currently held financial assets is perceived as likely to diminish. Consequently, transferring financial assets into real goods may be seen as rational behavior. All of this would result in a diminished rate of household saving.

Regulation and taxation.—Another factor that has been associated with the changing rate of household saving is the changing market of regulated and nonregulated financial instruments.² The interest rates on low-risk, highly liquid, regulated savings instruments, such as passbook accounts, have not risen to keep pace with the interest rates available on higher risk, less liquid, nonregulated savings instruments, such as certificate of deposit trusts. This widening differential in interest rates has been viewed as one factor that is associated with the diminishing rate of saving, especially among small savers such as low- and middle-income households. The following table shows the pretax yields available on regulated and nonregulated savings instruments at the beginning of the third and fourth quarters of 1979. The period spanned in this table is one of intense volatility in the money markets.

Several congressional committees, including the Senate Committee on Banking and the House of Representatives Subcommittee on Commerce, Consumer, and Monetary Affairs, have conducted hearings on the savings mechanisms that are available to the small saver. The focus of these hearings has been regulation Q that gives the Federal bank regulators (Federal Reserve Board, Federal Home Loan Bank Board, Comptroller of the Currency, Federal Deposit Insurance Corporation, and National Credit Union Administration) rulemaking power to establish ceiling interest rates, reserves, terms, and conditions for savings accounts. The Federal bank regulators have attempted to use regulation Q to assure stability of interest rates on savings accounts over the business cycle, provide for adequate housing finance, and maintain the stability and structure of financial institutions.

² In this paper the term "regulated savings instrument" refers to those savings mechanisms that are subject to the provisions of regulation Q. These include passbook savings accounts and certificates of deposit on which the interest rates, terms of withdrawal, and minimum time and amount are regulated. Nonregulated instruments include all other formal, institutional savings mechanisms, such as certificate of deposit trusts, bond funds, and Treasury bills and notes. While these nonregulated instruments may be subject to some form of Government regulation, they are not subject to the provisions of regulation Q.

YIELDS TO REGULATED AND NONREGULATED SAVINGS INSTRUMENTS¹

Instrument	Minimum amount (dollars)	Pretax yield; (percent)	
		Sept. 17, 1979	Oct. 15, 1979
Regulated:			
Banks and thrift institutions—			
Passbook savings accounts ²	None	5.25-5.50	5.25-5.50
Certificates of deposit ²	100	5.5-8.25	³ 5.5-8.25
6-mo. certificates	10,000	10.32	11.72
U.S. savings bonds	⁴ 18.75	6.5	⁵ 6.5
Nonregulated:			
Treasury notes, bonds, and other obligations	1,000-10,000	10.75-11.25	11.40-12.86
Treasury bills—			
13 weeks	10,000	10.353	11.836
26 weeks	10,000	10.315	11.716
Money market funds	1,000-5,000	10.48-11.10	11.06-11.98
Municipal bond funds	1,000-10,000	5.04-6.81	5.71-7.15
Corporate bond funds	1,000-5,000	8.16-10.20	8.20-10.35
Certificate of deposit trusts	1,000	11.50	12.93

¹ Based on rates quoted and/or advertised in the Wall Street Journal.² Subject to regulation Q.³ Varies with the term of the certificate.⁴ Subject to change Jan. 1, 1980.⁵ At maturity.

The opponents of Federal regulation of interest rates and other aspects of savings accounts have argued that regulation Q has cost small savers billions of dollars in foregone interest during the past year.³ Further, they have suggested that the below-market rates of interest currently offered on most regulated accounts are low enough to discourage saving and thus reduce the funds available for mortgage credit and general economic expansion.

Another issue raised in the congressional hearings into the small-saver question has been the taxation of interest on savings accounts. Several bills are now before Congress that would exempt a portion of the interest earned on savings accounts from Federal income taxation. Representative of these bills is an amendment to H.R. 3712⁴ that would allow a family to earn \$200 per year in tax-exempt interest on savings accounts. Proponents argue that this legislation would not only increase favorable tax status and stabilize account balances but also would increase the availability of mortgage funds. Opponents cite the argument that favorable tax treatment of interest earned on savings accounts would be more valuable to high-income taxpayers than to low-income taxpayers who are less likely to hold financial assets.

Aside from the controversy surrounding regulated savings instruments, there has been an expansion in the variety and availability of nonregulated savings instruments, such as money market certificates, diversified financial funds, and certificate of deposit trusts. There are some indications that these instruments have drawn funds from more highly regulated instruments but no evidence that they have induced households to increase their rate of saving out of disposable income [1].

³ Estimations of interest dollars foregone are calculated on the basis of the difference between market rates of interest and regulated rates of interest multiplied by the dollar amount of balances held in regulated accounts.

⁴ H.R. 3712 would amend Section 103 of the Internal Revenue Code of 1954 such that interest on mortgage subsidy bonds would no longer be tax exempt. No action has been taken on this legislation or the amendments to it.

Population trends.—Population trends also have been related to the decline in the household saving rate. Taken together, the increasing proportion of our population comprised of older dissavers and younger credit users may account, in part, for the currently diminished rate household saving.

The United States League of Savings and Loan Associations reports that 68 percent of the savings deposits held in its members' thrift institutions are controlled by persons over 55 years of age [7]. Many of these persons may be in the process of dissaving, that is, withdrawing lifetime accumulated wealth from their financial reserves. These withdrawals may depress the overall rate of household saving.

Similarly, the use of credit, another form of dissaving, depresses the national average rate of household saving. The expanding use of credit, particularly among new households being formed by those persons born during the "baby boom" of the late 1940's and early 1950's, may further influence the saving rate.

FAMILY CHARACTERISTICS

For assessment of the influence of changing family size, composition, and labor force participation on rates of household saving, national data documenting household savings patterns over time, as well as family characteristics, are needed.⁵ In the absence of such comprehensive data sets, cross sectional data have been analyzed to provide some insights into these relationships.

The Federal Reserve Board's 1977 Consumer Credit Survey reported the proportion of households holding financial assets [2]. Approximately three-fourths of all households held saving and checking accounts, one-third held bonds, and one-fourth held stocks or other securities. The survey results suggest that holding financial assets is related to the levels of household income and education and the occupation of the household head. While the survey did not report the dollar level of assets accumulated in any 1 year, the authors noted an upward trend in the total dollar value of the assets held by households. This wealth-effect occurred in spite of the declining rate of household saving.

Analysis of cross sectional data in the 1972-73 Consumer Expenditure Survey (CES) suggests that a number of household size and composition factors, as well as income and labor force characteristics, are associated with household saving behavior. In the CES, household saving is measured by change in the assets and liabilities held by the household, in other words, net worth change.⁶ Analyses showed that 27 percent of the variance in change in net worth during the survey year is explained by income, education, and occupation of household head, and economic contribution of the wife to the household.

The most important determinant of household saving, as measured in the CES, is total household income. As family income increases, the

⁵ Throughout this section of the paper reference is made to cross sectional and time series data and analyses. Cross sectional refers to data collected at a single point in time and analyzed to reflect conditions at that time. Time series refers to data collected over time and analyzed to reflect changing conditions or trends.

⁶ The CES is designed primarily to measure expenditure patterns, therefore, use of the survey to analyze asset accumulation is inherently limited. The CES measure of change in net worth includes only financial assets and liabilities and is not adjusted for change in purchasing power during the survey year. The CES measure is thus not necessarily comparable to other measures of household saving such as that from the Index of Consumer Confidence.

average propensity to save increases. For example, households with total annual income less than \$7,000 in 1972-73 tended to have a negative saving rate, while those earning \$20,000 to \$24,999 saved 9.3 percent of their total income. Use of the CES measure of household saving showed that the average propensity to save in 1972-73 among the sample population was 7.2 percent of total household income. That finding was not unexpected but the importance of the wife's contribution to household income in explaining variance in household saving was surprising. When adjustment was made for income, wife's contribution to household income significantly influenced the average propensity to save. The greater the wife's contribution, the greater the rate of saving reported by the household.

Cross sectional data from a sample of rural nonfarm households in central Pennsylvania were collected in a small pilot study. For households with similar incomes, single-earner families had a higher annual rate of accumulation of liquid financial assets than did multiple-earner families, but multiple-earner families increased their real net worth at a higher rate than did single-earner families [3]. In other words, families with high labor force participation rates acquired durables rather than financial assets. These findings cannot be generalized because of the nature of the sample population, but may provide some insight into the manner in which saving is measured. Perhaps the household saving rate has diminished, as measured, because changing family size, composition, and labor force participation rates have led families to divert resources from liquid assets to durable assets. In other words, possibly the underlying propensity to save among households did not diminish, but rather families have found new ways to "save." Additionally, these families may be substituting open lines of credit for liquid savings accounts as financial reserves.

IMPLICATIONS FOR FAMILIES

Some economists have predicted that household saving will increase late in 1979 and early in 1980 as consumer spending declines [8]. Generally these predictions are based on movement in the Survey Research Center's Index of Consumer Confidence. There is no broad consensus with this forecast or any other prediction regarding consumer saving and spending in 1980. This lack of consensus results in part from lack of national, longitudinal data on household saving and wealth on which to base predictions and in part on uncertainty as to the form of savings that households are currently using. Without information on how much is being saved or in what form it is being saved, prediction of future trends is extremely difficult.

In spite of this difficulty in predicting trends, the changing climate for household saving has several implications for families. First, as a general increase in the level of prices becomes more widely anticipated, families may be expected to divert savings from regulated instruments to nonregulated instruments and durable goods. This could expose family financial reserves to the high risk that is inherent in some nonregulated instruments and the low liquidity of durable goods. In other words, families may lessen their ability to respond to financial crisis quickly. Further, families may find that in making purchase decisions in advance of need for durable goods, they incur storage and mainte-

nance costs that they would not have incurred had they saved in advance and purchased at the time of need. Families should carefully evaluate increasing prices as a reason for changing savings patterns. While in some situations changing savings patterns may enhance economic well-being, in other cases it may not.

Second, potential deregulation of savings account interest rates and conditions could present families with a new array of savings alternatives from which to choose. While deregulation could increase interest rates in the short run and thus perhaps increase the rate of saving, it could also create more volatility in interest rates and thus diminish the ability of families to plan the growth of their financial reserves.

Finally, as family size decreases and more homemakers are gainfully employed, families may become somewhat insulated from certain financial crises such as those arising from temporary unemployment or short-term illness of the breadwinner. This insulation might lead families to have an increased sense of financial security and a decreased perception of need to save.

As household saving becomes less predictable, so do other conditions in the economy. Family economic decisions, such as the decision to save, are directly related to the overall functioning of our economy. Therefore, factors that influence household saving rates, such as the level of prices, regulation and taxation of savings accounts, population trends, and family characteristics, influence broad areas of the economy. These areas include the rate of economic growth, the level of employment, and the cost and availability of credit. Families should understand that their response to the changing climate for household saving does, in part, help to determine the economic climate in which they will operate in the future.

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NEW DIRECTIONS IN DIETARY GUIDANCE

(By R. G. Hansen, Departments of Nutrition and Food Science and Biochemistry,
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Standards for nutrient intake are largely based on the "Recommended Dietary Allowances" of the National Research Council Food and Nutrition Board. But while that publication generally considers nutrients, people obviously consume foods. The consumer who wants to make intelligent food choices must, therefore, make a transition from recommended nutrient intake to recommended food intake. Additionally, as consumers confront a more and more complex food supply, their choices become more difficult.

To meaningfully interpret nutrient allowances, an individual must know the nutrient compositions of the foods that are eaten. A direct comparison between what nutrients are in a particular food and what nutrients are needed by those who consume it gives a measure of food quality. By extending this approach, the adequacy of the national (or even world) food supply, and the nutritional health and status of those who consume that food, can be determined.

Clearly, the published "Recommended Dietary Allowances" deals with nutrients, and the important consumer questions ultimately relate to food choices. Furthermore, previous editions of the "Recommended Dietary Allowances" have focused attention on only part of those nutrients which are known to be required by humans. The 1979 edition increases the number of nutrients for which recommended allowances are given. But even as it does, consideration of the energy yielding components of the diet—fat and carbohydrate—while expected to be enlarged in comparison with previous editions, will still be far too limited for the purposes described above.

Consider that the consumption of fat as a proportion of calories has increased since the turn of the century to a point where fat may now provide 40 to 42 percent of all calories. This increase in fat consumption has largely involved vegetable oils, with the consumption of fats from animal sources (butter and lard) declining substantially during that same period. In conjunction with this increase in proportion of calories from fat, the consumption of foods containing complex carbohydrates, such as starch and fiber, has declined.

The consumption of alcoholic beverages as a proportion of calories is increasing. Enough beer, distilled spirits, and wine are being consumed to add approximately 200 calories per capita from alcohol as the average daily intake for everyone over age 14. If only half of the population consumed alcohol, that would mean about 400 calories per person from alcohol. Furthermore, if these choices are beer and wine, even though some additional nutrients are contributed, the nutrient density is low and the additional nonalcohol calories from beer almost double the calorie intake, and from wine are substantially increased.

For years, protein intake has been emphasized in technical and popular publications, and its practical importance may be overestimated in the public's mind. The results include an imbalance in education programs and an effort by segments of the food industry to promote high-protein foods and even protein supplements. Few would deny the important role that protein plays in the diet. In the United States, however, our average protein consumption is generally adequate, and rarely can an individual be found who is malnourished because of an inadequate consumption of protein.

While food consumption has changed since the turn of the century, so, too, has the activity pattern of the average American, resulting in a diminished requirement for energy from food. At the turn of the century, a high proportion of the population was engaged in the production of food, work that was highly demanding of physical effort. Now fewer than 5 percent of the population produces food. As we have become more sedentary, we have also become older as a population, again greatly reducing individual calorie needs. Indeed, many of us, especially women and older people, are consuming fewer than 2,000 calories per day. This suggests that, in order to meet the recommended dietary allowances, more care must be exercised in selecting foods. The consumption of foods high in fat, sugar, and alcohol must be restricted in the diet in order to meet nutrient needs within a limited calorie intake.

Recently, some notable attempts have been made to assess food and diet quality, and to publish the results as a way to enlighten the public and help people make the necessary transitions from nutrients to food. One example is the two editions of "Dietary Goals" developed by a Senate committee. Others include a major section of the Surgeon General's report, "Healthy People," and a segment of the publication from the Center for Disease Control, "Promoting Health and Preventing Disease." All of these documents may, in part, trace their origin to the increasingly vociferous interest of consumers in personal health issues and their desire to transpose recommended dietary allowances for nutrients into meaningful recommendations for food consumption.

What could be most helpful at the present time is an objective determination of the available information and the development of realistic and meaningful dietary guidelines to enlighten food choices. The National Academy of Science Food and Nutrition Board presumably has the creditability, but its members have been reluctant or unwilling to exercise it. This Board has persisted in its focus on nutrients, while saying little or nothing about food choices.

Why do people need such dietary guidelines? Because of the attractive but confusing array of foods available at the supermarket, consumers confront as many as 10,000 different options when purchasing food. A comparable difficulty attends the selection of food in the various establishments where much of the U.S. national diet is consumed at the present time. An infinite number of choices may be made en route to an unbalanced diet. The issue, thus, is how to make intelligent food choices. To be sure, a food is rarely selected just for its nutritional value. But it seems reasonable to try to make nutritional value an important consideration. Obviously, time constraints, availability of convenient foods, attractive packaging, and appetite appeal may sometimes be overriding considerations. For many individuals,

however, nutrition is becoming a significant issue in food choices, and that enhances public interest in and acceptance of educational efforts. The most widely recognized system of nutrition education focusing on food is the one that was developed by the U.S. Department of Agriculture, with its recommendations for consumption of foods from four basic food groups. This system needs no elaboration before this audience.

The new version (1979 release date) of the food group method of balancing a diet is called "Food." It recognizes a fifth group that includes foods high in fat, or sugar, or alcohol. Many of these foods are of low nutrient density (and, antithetically, high calorie density). Individuals whose calorie needs are least should, therefore, minimize their intakes of foods in this fifth category.

To assist consumers in making the transition from nutrient allowances to food choices at Utah State, we have been experimenting with a system to highlight nutritional quality of food based on nutrient density. This will now be described. For an individual to achieve and maintain proper weight for age, the amount of food consumed over a period of time must equate with his/her energy needs with high precision. The foods eaten to satisfy energy requirements must also satisfy the individual's allowances for all other nutrients. Admittedly, requirements for the various nutrients and, therefore, allowances based upon those requirements are not strictly related to energy in some cases. Nevertheless, expressing dietary allowances in terms of energy permits a number of useful applications.

Expressing the nutrient composition of the food supply, the diet, or an individual food and the human dietary allowances for individual nutrients on the same basis—that is, nutrients per 1,000 kcal—permits a direct comparison between the two parameters, and quality judgments may be derived. By exploiting the resulting ratio, an assessment of a food supply or food combination to meet dietary allowances becomes possible, and food manufacturers, Government agencies, and consumers have an easy means of understanding the nutritional contributions of a food to a balanced diet. Such ratios permit foods to be examined (and compared) with respect to ability to meet dietary allowances relative to the calories provided.

To obtain a single-value allowance for each nutrient, its RDA must first be converted into an allowance per 1,000 kcal. This is done by dividing each RDA by the average calorie allowance and multiplying by 1,000; the results are shown in table 1. The allowances for many nutrients per 1,000 kcal are constant, or approximately constant, thus simplifying the choice of the single value of these nutrients. For those nutrients whose values are not constant, the single-value allowances should be largely based on the allowances for those persons whose nutrient-to-calorie needs are greatest, that is, those with the lowest calorie needs, since they find it most difficult to meet other dietary allowances.

In many situations it would be helpful to have guidelines for intakes of fat and carbohydrate. Since no authoritative body has delineated an advisable intake, we have arbitrarily defined a standard of 35 percent of calories or 39 grams per 1,000 kcal. The remaining of the calories would be provided by carbohydrate, or 187.5 grams per 1,000 kcal. We believe that the 35 percent of calories from fat is a reasonable guide,

since palatable diets can be planned within this standard, using readily available foods. As an average in the United States, the proportion of polyunsaturated (P) to saturated (S) fatty acids is currently about 0.7 (9), which many regard as appropriate. Thus, for our calculations, the P:S ratio of 0.7 was chosen.

Table 2 summarizes the recommended single-value allowances per 1,000 kcal. These allowances can be used as guidelines in describing the nutritional quality of food, and they permit comparisons between calorie allowances and those for other nutrients.

To further assist consumers and professional nutritionists, advisable recommended dietary allowances for certain vitamins and trace elements are included in the 9th edition of the RDA's. Limitation of information regarding nutrient content of many foods and an inadequate knowledge of requirements for those nutrients prevent their being listed in the general summary table. A need has emerged for establishing allowances for some nutrients not listed in the summary table; thus where it is insufficient to warrant establishing an allowance in the traditional sense, an advisable or safe and adequate daily dietary intake has been suggested. Such allowances are less well documented by research and observation and should be regarded as somewhat tentative and evolutionary in nature. As more research information becomes available, these allowances may expect to assume the status of those listed in the general table. Table 3 is a list of the estimated safe and adequate daily dietary intake given in terms of nutrients per 1,000 kcal.

Requirements for pantothenic acid and biotin, as well as their occurrence in food, are known with less certainty than for other vitamins; hence, it is appropriate that allowance for them imply more of a "provisional" status. The function of vitamin K in human metabolism has been well established; however, a dietary need has not been well defined except in newborn infants prior to establishment of intestinal flora. Thus its inclusion at this time is warranted.

Some nutritionists feel that our consumption of sodium is too high; therefore, an advisable RDA for sodium is suggested to help those who wish to control the amount of sodium consumed. Since sodium, potassium, and chloride are important in maintaining proper electrolyte balance, an estimated safe and adequate daily dietary intake is also suggested.

Perhaps the most cogent argument for estimated safe and adequate daily dietary intakes can be developed relative to requirements for trace elements which are not listed in the general table; namely, copper, manganese, chromium, selenium, and molybdenum. Fluoride is clearly recognized as needed to promote growth of experimental animals being fed purified diets. It is becoming increasingly evident that the function of fluoride in bone and teeth development in human beings is positive and fundamental. To reduce the incidence of dental caries, it has become customary to add fluoride to the water supply. Therefore, it is appropriate to state the "allowance" for fluoride as parts per million, or milligrams per liter of water, rather than per 1,000 kcal.

Requirements of the human for sulfur and cobalt are met with sulfur-containing amino acids and vitamin B₁₂, respectively. There is sometimes an exogenous need for choline and inositol for animals and micro-organisms; there is no evidence, however, of special needs in

human beings beyond what is normally consumed in food and biosynthetic capacity. Claims of unusual nutritional benefits for inositol and choline consumption are unfounded, and a provisional allowance for either compound is unwarranted at this time. Finally, elements such as tin, vanadium, silicon, and arsenic are probably nutritionally important for some species, but data for human beings are not available.

A 1974 report of the Food and Nutrition Board of the National Academy of Science recommended that the standard enrichment of flour and cereal products be extended to include more trace nutrients. Cereals are an important calorie source for many people, especially for the poor (20 to 30 percent of calories). Since vitamin B₆, zinc, and magnesium may be consumed in limited quantities by a growing segment of the population, such nutrients might advantageously be included in flour and cereal products. For some trace elements (i.e., selenium and copper), however, the dietary level is adequate and the range between adequate intake and toxicity is narrow. Hence, some caution should be exercised in widespread enrichment or fortification efforts.

An expectation has been created among consumers that consumption of limited quantities of some fortified foods will provide all of the recommended dietary allowances for all nutrients. Out of this has come the formulation of "foods" similar to the preparations available for intravenous feeding. These parenteral and enteral preparations presumably contain all of the required nutrients in reasonable proportions.

The expanded list of nutrients in the 1979 edition of the RDA includes additional vitamins and trace minerals, the importance of which in food can better be understood in terms in intrinsic versus extrinsic occurrence. If some of the "leader" reference nutrients are intrinsically present in a food, positive qualitative assumptions are generally justified relative to the occurrence of many other nutrients. This is especially true if processing has not removed nutrients, and if the food was derived from a plant or animal source that was once alive. Admittedly, the balance among nutrients may differ from that recommended for human consumption, nevertheless, most trace nutrients can be expected to be plant- or animal-derived. On the other hand, if the reference nutrients have been added (i.e., occur extrinsically), the food may not serve as a reasonable source of the nutrients not added. This discussion assumes that it is important to consume most nutrients in some approximation of their RDA proportions, an assumption that may be especially significant because of complex dietary interactions with the trace minerals. Particularly for educational purposes, the occurrence of leader or reference nutrients in foods should be referenced as being there "intrinsically" or "extrinsically."

The next consideration logically follows, what of the reference nutrients (those commonly referred to in education programs and most generally added to fortified food) in any education program? There may be other nutrients more appropriate to accent in describing food quality to the consumer. Currently it is clear that the energy yielding components of food are of much public interest, and more attention must be given to these. On the other hand, a substantial proportion of the calcium and riboflavin in the American diet comes from milk. With that in mind, should both calcium and riboflavin be referenced as "leader" nutrients in an educational program? Protein, and also

tryptophane (a metabolic precursor of niacin) intake, are almost without exception adequate diets in the United States. Furthermore, most flour is enriched with niacin. All of these conditions combine to make the risk of pellagra almost nonexistent in the United States. Hence, niacin may not be appropriate as a leader nutrient. A strong case may be developed, however, for adding vitamin B₆, zinc, copper, and perhaps others, to any list used for educational purposes.

While the National Research Council in 1974 emphasized the need to add or broaden our food enrichment policies to include other trace nutrients, the Food and Drug Administration has not responded. Meanwhile, the Surgeon General advises us to reduce our intakes of meat, an important source of nutrients largely discarded in the flour milling process. Hence, the two agencies seem to be offering contradictory advice to the consumer. In other words, either the cereal and flour enrichment formulations should include those nutritional elements that are discarded in the milling process, or we should continue to consume meat, which is an especially good source of most of those trace nutrients.

Currently there is a considerable amount of professional and consumer interest in the labeling of foods. The ingredients, the principle sources of energy, the nutrients individually, and salt and cholesterol content are all major considerations. With the limited size of food containers and the interest and capacity of the consumer to assimilate the information, what is ultimately placed on the label should be carefully reviewed, rationalized, and evaluated, and a complementary educational program developed.

Whatever labeling information and format is finally adopted, without an extensive educational program it may not be effective. It has been our experience that educational programs can have a meaningful beginning on an elementary level. Our work suggests that graphically presented nutrition information at this level can alter food consumption patterns. Furthermore, we have been able to measure consumer response to various types of labeling formats and have discovered that graphical methods or presenting nutrition information are readily understood and accepted by consumers at the point of food purchase. Whatever labeling system emerges should be accompanied by an extensive educational program in the schools and with the public.

In most nutrition surveys, the persons at greatest risk are frequently on the low end of the economic scale. While, admittedly, there are others of the population who consume deficient quantities of specific nutrients, it is generally true that those with the least resources are at the greatest risk of nutritional deficiency. There is also a consensus that obesity is the major nutritional problem in the United States. Obesity is more of a problem with the economically disadvantaged, but is likewise a problem for people of all economic levels. But it is surprising that it occurs so frequently among the poor (who also are at the greatest risk for other nutrient deficits), who probably are engaged in occupations that require more physical activity. It seems a contradiction to discover people who are deficient in nutrients, yet overweight. For whatever reason, the argument can be made that an education program based on nutrient density could help discriminate when alternative food choices are available.

Practically, consumers—whether children or adults, male or female—generally obtain their dietary allowances from a common table

or restaurant menu, making choices according to individual preference. Thus those whose calorie needs are minimal, or who have special dietary needs, may find it exceedingly difficult to meet their dietary allowances. For that reason, nutrient allowances cited in this text per 1,000 kcal, when not a constant as derived, have been largely based on the allowances established for individuals whose nutrient-to-energy needs are greatest. Those who, for one reason or another, want to reduce their calorie consumption below their energy allowance, would need to select foods having a high nutrient density. For example, a 1,000 calorie weight-reduction diet, in order to be nutritionally adequate, should supply most nutrients and protein in approximately double the allowances cited per 1,000 calories.

Allowances per 1,000 calories should be used by public agencies as standards for estimating food requirements for health and welfare programs, or other public assistance. Food choices and menus should include a wide variety of palatable, acceptable foods. An individual food or even a meal, cannot reasonably be expected to contain full allowances for all nutrients. However, over a period of time, which may range from days to weeks, depending on the nutrient under consideration, the food consumed in total should include all nutrients at allowance levels in proportion to calories.

For a general population, the nutrient allowance per 2,000 kcal would be a particularly useful standard. For a group of people of specified age or sex, however, their more specific allowances should provide the frame of reference. The amounts of foods that will meet the total nutrient and energy needs of that population can thus be calculated.

In developing and marketing new products that may displace traditional foods, it would seem more appropriate to use the nutrient composition of the food displaced as a guide for fortification rather than a standard derived from RDA's. Each new product would, insofar as possible, match the recognized significant nutrients of the food it displaces. On the other hand, for new products, that are not identified in any way with traditional products, but which might become important sources of energy, RDA's expressed per 1,000 kcal could provide a standard for nutritional formulation.

Guidelines are usually provided to illustrate how nutrient needs can be met by selecting from among a relatively few groups of foods. Such food groupings and food guides are useful for illustrating the essential elements of a basic diet. It is important, however, that such guides be adapted and modified imaginatively to meet the needs of individuals and families with different levels of income, cultural patterns, and lifestyles. Categorization of a food as either good or bad is meaningless because individual foods must be considered in terms of how they contribute to the balance of nutrients in an overall diet within energy needs. The RDA's for nutrients can be obtained from a wide variety of food combinations and dietary patterns—any of which can be adequate, provided care is exercised in food selection. To make the transition from nutrients to foods which both professionals must do, nutrient density provides a useful reference base. From that base, for dietary consideration, favorite foods or recipes may serve as an initial starting point so that within calorie restrictions, appropriate food choices may be made in order to achieve a balanced intake of nutrients.

TABLE 1.—NUTRIENT ALLOWANCES PER 1,000 KCAL DERIVED FROM RECOMMENDED DIETARY ALLOWANCES (NAS NRC 1979)

Age (years)	Energy (kcal)	Protein (g)	Fat-soluble vitamins					Water-soluble vitamins					Minerals					
			Vita- min A (ug R.E.)	Vita- min D (ug)	Vita- min E (mg α I.E.)	Vita- min C (mg)	Thia- min (mg)	Ribo- flavin (mg)	Nia- cin (mg N.E.)	Vita- min B ₆ (mg)	Fola- cin (ug)	Vita- min B ₁₂ (ug)	Cal- cium (mg)	Phos- phorus (mg)	Mag- nesium (mg)	Iron (mg)	Zinc (mg)	Iodine (ug)
Children:																		
1 to 3	1,300	18	303	8	4	35	0.5	0.6	7	0.7	77	1.5	615	615	115	11.5	7	54
4 to 6	1,700	18	294	6	4	27	.5	.6	7	.8	118	1.5	471	417	118	5.9	6	53
7 to 10	2,400	14	292	4	3	19	.5	.6	7	.7	125	1.3	333	333	104	4.2	4	50
Males:																		
11 to 14	2,700	17	370	4	3	19	.5	.6	7	.7	148	1.1	444	444	130	6.7	6	56
15 to 18	2,800	20	257	4	4	21	.5	.6	6	.7	143	1.1	429	429	143	6.4	5	54
19 to 22	2,900	19	345	3	3	21	.5	.6	7	.8	138	1.0	276	276	121	3.5	5	52
23 to 50	2,700	21	370	2	4	22	.5	.6	7	.8	148	1.1	296	296	130	3.7	6	56
51 plus	2,400	23	417	2	4	25	.5	.6	7	.9	167	1.3	333	333	146	4.2	6	63
Females:																		
11 to 14	2,200	21	264	5	4	23	.5	.6	7	.8	182	1.4	546	546	136	8.2	7	68
15 to 18	2,100	22	381	5	4	29	.5	.6	7	1.0	191	1.4	571	571	143	8.6	7	71
19 to 22	2,100	21	381	4	4	29	.5	.6	7	1.0	191	1.4	381	381	143	8.6	7	71
23 to 50	2,000	22	400	3	4	30	.5	.6	7	1.0	200	1.5	400	400	150	9.0	8	75
51 plus	1,800	24	444	3	4	33	.5	.7	7	1.1	222	1.7	444	444	167	5.5	8	83

TABLE 2.—*Single-value nutrient allowances per 1,000 kcal*

Vitamin A	400 mg.	Phosphorus	450 mg.
Vitamin D	4 μ g.	Magnesium	150 mg.
Vitamin E	4 mg α T.E.	Iron	8 mg.
Vitamin C	30 mg.	Zinc	8 mg.
Thiamin	0.5 mg.	Iodine	75 μ g.
Riboflavin	0.6 mg.	Protein	25 g.
Niacin	7 mg N.E.	Carbohydrate	187.5 g.
Vitamin B ₆	1.0 mg.	Fat	39.0 g.
Folacin	200 μ g.	Oleic F.A.	12.25 g.
Vitamin B ₁₂	1.5 μ g.	Linoleic F.A.	10.0 g.
Calcium	450 mg.	Saturated F.A.	14.25 g.

TABLE 3.—ESTIMATED SAFE AND ADEQUATE DAILY DIETARY INTAKES

	Range for adults	Per 1,000 kcal
Vitamin K	70 to 140 μ g.	30 μ g.
Biotin	100 to 200 μ g.	50 μ g.
Pantothenic acid	4 to 7 mg.	2 mg.
Copper	2.0 to 3.0 mg.	1 mg.
Manganese	2.5 to 5.0 mg.	1.5 mg.
Flouride	1.5 to 4.0 mg.	1 mg/1 of H ₂ O.
Chromium	0.05 to 0.2 mg.	0.03 mg.
Selenium	0.05 to 0.2 mg.	0.035 mg.
Molybdenum	0.15 to 0.5 mg.	0.08 mg.
Sodium	1,100 to 3,300 mg.	1,500 mg.
Potassium	1,875 to 5,625 mg.	2,500 mg.
Chloride	1,700 to 5,100 mg.	1,500 mg.

DIETARY GUIDANCE IN THE MARKETPLACE

(By R. O. Nesheim, Ph. D., the Quaker Oats Co.)

The publication of the dietary goals for the United States by the Select Committee on Nutrition and Human Needs of the U.S. Senate in February 1977 triggered a major discussion on the role of diet in chronic disease. From this discussion and the controversy over many of the statements in the publication, the concept of developing dietary guidelines for the United States has evolved. The U.S. Department of Agriculture and Department of Health, Education, and Welfare have been working for some time to develop a joint dietary guideline statement.

Why is there such a broad interest amongst the nutrition community, government regulators, and consumer groups in the development of dietary guidelines? The proponents of dietary guidelines believe that such a statement would assist consumers in the selection of diets which would aid in maintaining better health. While specific dietary guidelines have not been published at this time, the primary emphasis appears to be in four areas. These are:

1. Balance caloric intake and expenditure to achieve and maintain a desirable weight;
2. Reduce total consumption of calories from fat, sugar, and alcohol;
3. Increase the consumption of complex carbohydrates; and
4. Control the intake of salt.

While there has been considerable controversy in the nutrition community over the dietary goals, the differences are primarily over the specific numbers attached to the goals and to the claimed health benefits which may accrue to the individual. There has been much less controversy over the proposed direction of dietary changes.

I have been asked to discuss the topic of dietary guidance in the marketplace.

First, let me make it perfectly clear that I support the concept of dietary guidelines. I do have some concern over what may be potential improper uses of guidelines. This will be discussed later.

First let's consider the purpose of publishing dietary guidelines.

With the improvement that has taken place in our food supply, economic status, and medical care, problems with nutritional deficiency diseases and infectious diseases have largely been overcome. The concern today primarily focuses on the tremendous costs of the so-called chronic diseases, such as atherosclerosis, coronary heart disease, diabetes, hypertension, and cancer. While the evidence is not clearly established in many areas, diet is considered an important factor in their etiology. Epidemiological evidence is often cited to show that on a population basis the risk of death from these chronic diseases in the population can be reduced by modification of the so-called typical America diet. With the extreme variation that exists for most indi-

viduals in their susceptibility to these diseases, the benefits that might accrue to the individual are less clear and part of the reason for much of the controversy over the benefits to be achieved by dietary modification.

The primary purposes for establishing dietary guidelines, in my opinion, are:

1. To provide consumers a framework for the selection of a good diet;
2. To provide a focus for nutrition education programs;
3. To identify potential areas for modification of food and/or dietary practices;
4. To serve as a useful guideline for industry in product development and marketing.

With these purposes in mind, how can dietary guidance function in the marketplace?

At the outset it is important to understand the limitation any one food manufacturer faces in influencing an individual's diet. Food manufacturers develop and market individual products which for the most part are consumed as only a portion of one's diet, and the same product is usually not consumed every day. In fact, a product may be consumed only at weekly or monthly intervals. Therefore, it is not feasible in most instances to have a significant impact on one's total diet through the development or modification of a single product. The principal responsibility for achieving a change in diet composition, therefore, lies with the individual. The composition of our diet is the sum of the contributions of the many individual products selected for consumption during the day, week, or month. This establishes the typical dietary pattern of the individual. The consumer must be motivated to want to change his dietary pattern. Educational programs carried out primarily by local, State, and national government can create an awareness by consumers of the important linkages between diet and health. These educational efforts can provide information concerning our knowledge on the relationships between diet and chronic diseases including the controversies that exist within the scientific community. As consumers become more aware of their role in selecting an appropriate diet, they may be motivated to seek out food products processing the characteristics they desire.

The primary source of manufactured product information for consumers will be from the product label. Nutrition labeling has provided a means of communicating to consumers product composition. Current evaluation of labeling programs will likely lead to more effective ways of providing meaningful and useful information to aid in the selection of the desired diet. Products advertising may also create an awareness concerning products whose composition meets the dietary interests of the consumer. The label and the advertising message in themselves are not likely to provide motivation for dietary change. It is rarely possible to develop a food product for which a specific health claim can be made. As discussed earlier, an individual product makes up only a portion of one's daily diet and is consumed usually on an irregular basis. A label claim or product advertising may be largely descriptive, such as "low calorie," "low sodium," "high in polyunsaturated fat," "no cholesterol," and so forth. Nutrition labeling provides information on calories, fat, total carbohydrate, total sugar, and sodium, as well as many nutrients on a per-serving basis. This is a

useful source of information to aid in purchasing decisions. Any benefit which the consumer may obtain from use of the product is that imputed by the consumer.

Aggressive companies in the food industry are carefully probing to determine consumer awareness and interest in important food and nutrition areas. This information helps guide product development efforts to provide products in keeping with the consumer's awareness and interest. Food manufacturers who correctly perceive the direction of change in the consumer's interests can capitalize on these through developing products which fit their perceived interests. An initial competitive advantage can be achieved by those who are in the lead in this development. Products developed and marketed must still meet the necessary standards of acceptance, convenience, and cost benefits and nutritional value as perceived by the consumer to be successful. While consumers are becoming increasingly aware of nutrition and dietary relationships, individual products that do not meet consumer standards for acceptance and economy will not succeed on the basis of nutritional value. Typically, nutrition ranks third in the purchasing decision process, which is really not surprising considering the large number of alternatives from which consumers can select today.

Dietary guidance in the marketplace is provided by the complex interaction that occurs through greater consumer awareness and knowledge of food and nutrition and the role of diet in foods and health. This information is provided to the consumer through nutrition education efforts largely carried out by various government sources but also through the media and educational materials from the food industry. The food industry, monitoring the trend in consumer awareness and behavior, may see opportunities for developing new or modifying old products and positioning them through marketing efforts to meet the consumer's interests. Information provided through product labeling and advertising aids consumers in making informed choices.

Dietary guidelines can be a very useful means of providing a consistent direction for educational and marketing efforts. As new information is developed, it can be communicated to the consumer through the various educational channels. Product changes may occur if the direction is clear and consumer understanding is achieved. Dietary guidelines must not be used to control the composition of individual food products through regulation. This reduces flexibility in product development and modification and fails to recognize the limited role that any one product has in affecting the dietary change. Clear and effective product labeling offers one of the best ways of informing the consumer concerning product attributes and aiding consumers in appropriate use of the product in their chosen dietary pattern.

In summary, effective dietary guidance in the marketplace is the result of the combined efforts of educational processes usually conducted by governmental agencies and the academic community and the product development, food labeling, and marketing programs of industry. This combined approach assures a voluntary change in diets of consumers. Evolutionary rather than revolutionary changes are desirable, as this permits a continuing evaluation of the effects of dietary changes on the health of our population. A continuing dialog between government, industry, and consumers is essential as we transfer new research information into practice to achieve the common goal of providing Americans with the most healthful diet our scientific and technical knowledge will permit.

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CHANGES IN NUTRIENT LEVELS AND FOOD USED BY HOUSEHOLDS IN THE UNITED STATES, SPRING 1965 AND 1977

(By Frances J. Cronin, Consumer and Food Economics Institute, Human Nutrition Center, Science and Education Administration)

What changes have occurred in the kinds and quantities of foods used by households in the United States? How have these changes impacted on the food energy and nutrients available to households? Preliminary data on food consumption of about 3,500 households in the spring portion of the 1977-78 Nationwide Food Consumption Survey and data from the 1965 Household Food Consumption Survey¹ provide some answers.

SCOPE AND DATA COLLECTION OF 1977-78 SURVEY

The Nationwide Food Consumption Survey (NFCS) 1977-78 is the sixth conducted by the Department of Agriculture since 1936. From April 1977 to March 1978, a sample of households was surveyed, and information was obtained from approximately 15,000 households in the 48 conterminous States.

The survey provides detailed information on food used by households, from which the nutritional quality of household food supplies can be estimated. It also provides data on home production of food, household income, participation in food programs, education and employment of household heads, and other factors that might affect food consumption.

Information on household food use was obtained through an interview with the person identified as most responsible for food planning and preparation. Trained interviewers used an aided recall schedule to obtain the kind, the form, the quantity, and the cost (if purchased) of each food and beverage used in the household during 7 days prior to the interview.

Households were contacted at least 7 days prior to the interview and asked to keep informal notes to assist them in recalling the food used during the 7-day period. This procedure differed from that of previous surveys, when households were interviewed at the time of the first contact. It was anticipated that the new procedure would assist the respondent in establishing the beginning and ending of the 7-day period and help prevent them from "telescoping" or reporting foods used to the desired 7-day period. To measure the impact of this change in procedure, about 1,300 households from a special "bridging"

¹ Agricultural Research Service, Consumer and Food Economics Institute. Dietary levels of households in the United States, spring 1965. U.S. Department Agr. HFCS 1965-66 Report No. 6, 117 pp., illus. 1969.

sample were interviewed without prior contact during the spring quarter. Preliminary analysis of data from the bridging sample and data obtained during the spring quarter by the new procedure indicate that the latter procedure did not affect data concerning the aggregate nutrient levels of food used by households.

Food consumption information was obtained only from housekeeping households² in 1965. Although all households surveyed were included in 1977, only housekeeping households are used in this report for the 1965 and 1977 comparisons.

CALCULATIONS OF NUTRIENT LEVELS

Nutrient levels reported in this paper were calculated from information collected on the kinds and quantities of food used by the households during 7 days and from information on nutritive value of foods provided by the Consumer and Food Economics Institute.

The nutritive value of the food used is calculated for the edible portion of food as brought into the household. Only the vitamin values are adjusted for cooking loss. Thus the nutritive value of household food includes values not only of food eaten by people in the household but also of some food that is not eaten. This would include edible food discarded in the kitchen and at the table and leftovers fed to animals. Some households customarily do not eat all edible parts of certain foods, such as fat that can be trimmed from meat. Therefore, while this report shows the nutritive value of food available from household food, it slightly overestimates the food energy and nutrient levels of foods eaten in many households.

The average³ quantities of food and nutrients from household food supplies are presented in terms of an "equivalent person" in this report. An equivalent person is equal to 21 meals eaten at home in a week (based on three meals a day). The equivalent person is used in an attempt to adjust for meals eaten away from home by household members and for meals and snacks eaten in the home by guests and employees. This measure would not account for the age or sex of people eating in the household; and, therefore, the nutrient values presented in this report are not comparable with the recommended dietary allowances, which differ depending on age and sex.

In comparing the information obtained on household food use in the spring of 1965 and 1977, changes in the age distribution of the population during the last decade should be noted (fig. 1). Bureau of the Census statistics indicate that the percentage of the population under 18 years of age declined about six points, while the percentage of those between 18 and 44 years of age increased over four points. The percentage of those over 64 years of age increased about one point.⁴ The number of households with one or two members in-

² Housekeeping households are those with at least one person having 10 meals from the household food supply during the 7 days preceding the interview. Ninety-three percent of the households surveyed during the spring of 1977 met this criterion.

³ Average value for both quantities of food used and nutrients per 21-meal-at-home equivalent person were calculated using a population ratio procedure. Aggregate values for all households were divided by aggregate numbers of 21-meal-equivalent persons in all households.

⁴ Bureau of the Census Current Population Reports. Series P-25, No. 519, "Estimate of Population of the United States by Sex, Age, and Race: April 1, 1970 to July 1, 1973." U.S. Government Printing Office, Washington, D.C., 1974. Bureau of the Census Statistical Abstract of the United States: 99th ed., U.S. Dept. Com., 1,057 pp. 1978.

creased, while the number of households with five or more members declined. Further analysis will be necessary to assess the impact of these changes. Finally, data presented here are average values, which mask the variations among the households.

SPRING 1965 AND SPRING 1977

Comparison of preliminary data on household food consumption for the spring of 1977 with data obtained for the spring of 1965 indicates changes in the average nutrient levels of food used over the 12-year period (table 1). Food energy (calories) available declined about 10 percent, reflecting decreases in dietary fat, in carbohydrate, and in protein. At the same time, the levels of all vitamins and minerals except calcium were similar to or higher than those found in 1965. Nutrients which increased most since 1965 were ascorbic acid and thiamin. The decline in the level of calcium may be related to the smaller proportion of children and teenagers in the population. Milk products are the major source of calcium in the United States, and children and teenagers are their largest consumers.

The concurrent decrease in food energy and the increase in the amount of vitamins and iron indicate that food used by households in 1977 had a higher nutrient density than food used in 1965. The upward shift in the level of vitamins was the reverse of the trend seen between 1955 and 1965.

The changes in the average nutrient levels reflect differences in food use in 1965 and 1977. For example, the 5-percent decline in the consumption of milk and dairy products on a milk equivalent⁵ basis (table 2) was reflected in the decline in the calcium level. The total amount of meat, poultry, fish, and other high-protein food such as beans, eggs, and nuts was essentially unchanged. However, there were changes within this group. Beef, poultry, fish, and nut consumption increased, while the amounts used of pork (including bacon and salt pork), luncheon meat, eggs, and dry beans declined.

The decline in the average quantity of all vegetables used by households appears to have been due primarily to a decline in the use of potatoes at home. The use of dark-green vegetables increased (table 2). These vegetables are good sources of vitamin A and, if not overcooked, of ascorbic acid as well as nutrients not detailed in this report, such as vitamin B₆, folacin, and magnesium.

The use of fruits, particularly citrus fruits, increased. This, coupled with the increased use of dark-green vegetables and ascorbic-acid-fortified fruit drinks, punches, and ades, probably accounted for the large increase in the level of ascorbic acid in food used (table 1).

The use of bread and cereals declined on a flour-equivalent⁶ basis between 1965 and 1977. This decline did not cause a decrease in the levels of thiamin, preformed niacin, and riboflavin in the food used for two reasons. First, in 1975 the Federal standards for enrichment of flour and bread with these nutrients was increased. Second, the proportion of unenriched refined bread and cereal products declined markedly from 21 percent of all breads and cereals used in 1965 to 5 percent in 1977.

⁵ Milk equivalent: Quantity of whole fluid milk to which dairy products (except butter) are equivalent in calcium.

⁶ Flour equivalent: Weight of flour, cereals, meals, pastes, plus dry weight of flour, cereals, meals, and pastes in prepared products and bakery products.

The decline in energy content of food used at home was a major change between 1965 and 1977. Of the energy providing nutrients, carbohydrates declined the most (table 1). Contributing to the decline was the decreased use of bread and cereals, milk products, and sugar, sirup, jelly, and candy. However, not all high-sugar products declined (table 2). Consumption of soft drinks, punch, and sugar dessert increased, particularly those fortified with ascorbic acid.

The decline in fat reflects decreases in the household use of fats, oils, and milk products. Also there was a reduction in the use of fatty pork products (such as bacon) and luncheon meats.

COMPARISON BY INCOME

Income information obtained in 1977 is not directly comparable to that obtained in 1965. However, for the purpose of comparing the quantities and nutrients in food used in households at different economic levels, the total number of households reporting income in each of the 2 years was divided into five groups according to both income and percentages of households. For example, the group with the lowest income contained all households reporting income of less than \$3,000 after taxes in 1964 (22.2 percent of the 1965 sample) and of less than \$6,000 before taxes in 1976 (21.6 percent of the 1977 sample). No adjustment was made for family size. Placement in the lowest income group does not mean that a household had an income that placed it below the poverty line.

The level of energy in food used was 8 to 12 percent lower for households in all income groups in 1977 as compared to 1965 (table 3). The 9-percent decline in the energy level in foods used by the low-income group was slightly less than that in most other income groups. The decline was rather low primarily because the decline in fat use was lower for the low-income group than for the higher income groups between 1965 and 1977. The level of protein in food used by the low-income group was essentially the same in 1977 as in 1965.

Table 3 shows the percentage changes between 1965 and 1977 in the levels of vitamins and minerals for households in the low-income group; all levels except the calcium level increased. The largest percentage increases in levels of vitamins and iron between 1965 and 1977 were for the low-income group and to a lesser extent in the next-to-lowest income group (table 3). The food used in households in the low-income group in 1977 contained appreciably more ascorbic acid, vitamin A, thiamin, preformed niacin, and riboflavin than households in a similar income grouping in 1965.

In general, households at different income levels in 1977 used foods which were more similar in nutrient content than those in 1965 (table 3). Lower levels of nutrients noted on previous surveys for the households in the low-income group are not apparent in the 1977 data. While the use of foods from the milk group and the bread and cereal group by the low-income group declined, the consumption of foods from the meat, poultry, fish, and beans group and the fruit and vegetable groups

increased (table 4). The decreased use of milk and dairy products was probably most responsible for the decline in the level of calcium in the low-income group. This group used less milk and dairy products than any other income group in both 1965 and 1977, partly because it had the largest proportion of one-person adult households. The proportion was higher in 1977 than in 1965.

The decreased use of bread and cereal products by low-income households did not affect nutrient levels adversely because flour and bread products were more highly enriched in 1977 than in 1965, and because most of the decline was in the use of refined unenriched products. Households in the low-income group have always used more bread and cereal products than have households in other income groups. In 1977, however, differences between the low-income and higher-income groups in use of these products was smaller than that in 1965 (table 4).

The increased consumption of the meat, fish, poultry, and beans group by low-income households reflects an increased use of all types of meat, fish, and poultry, except bacon and salt pork. The low-income group also decreased their use of eggs and beans. Households in this group consumed more pork, poultry, fish, and luncheon meat and less beef than did households in most higher income groups.

The use of vegetables by households in the lowest income group increased between 1965 and 1977. Quantities in 1977 were similar to or higher than those used by the other income groups. While the home consumption of potatoes declined during the 12-year period, the use of all other types of vegetables increased. The low-income group used more dark-green and deep-yellow vegetables in 1977 than did households with higher incomes (table 4).

Households in the lowest income group also increased their use of fruits between 1965 and 1977. Most of the increase was in the use of citrus fruit and juices. The increase is equivalent to almost two cups of citrus juice per person per week between 1965 and 1977.

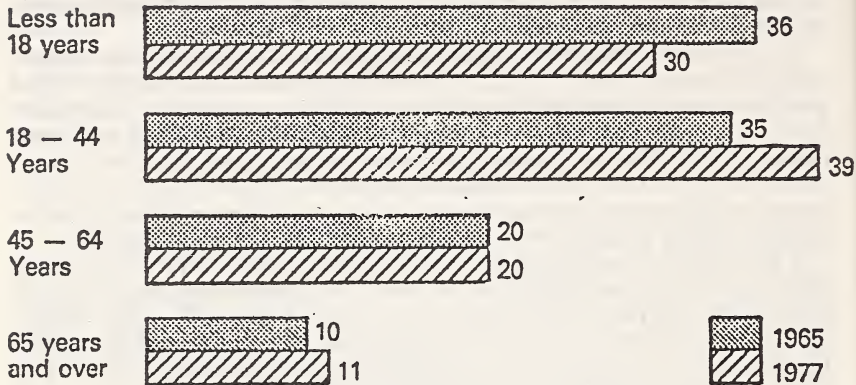
Overall, households at different income levels used quantities of the various food groups which were more similar in 1977 than in 1965 (table 4).

SUMMARY

Differences in the quantity of food used by housekeeping households in the spring of 1977 and the similar survey in the spring of 1965 were reflected in differences in energy and nutrient levels in food used. There was a 10-percent decline in the level of food energy, probably due to a decreased use of milk and dairy products, bread and cereals, fats and oils, and most foods high in sugar. The decline in food energy was not coupled with a decline in the level of vitamins or iron. Only the level of calcium in food used decreased. Therefore, the food used in the spring of 1977 had a higher nutrient density than that used in 1965.

The average nutrient levels for households in the lowest income group generally improved more than those in other income levels. In general, the nutrient levels and quantities of food used were more uniform at the various income levels in 1977 than in 1965.

Percent Change in Age of Population 1965 to 1977



Source: Bureau of Census

Figure 1

TABLE 1.—COMPARISON OF NUTRIENT LEVEL IN FOOD USED IN HOUSEKEEPING HOUSEHOLDS IN THE UNITED STATES, SPRING, 1965-77

Nutrient	Average ¹ per person, ² per day		Percent ³ change from 1965
	1965	1977	
Food energy (calorie).....	3, 210	2, 900	-10
Protein (gram).....	106	102	-4
Fat (gram).....	154	140	-9
Carbohydrate (gram).....	353	307	-13
Calcium (milligram).....	1, 110	1, 070	-4
Iron (milligram).....	20	20	2
Vitamin A (international units).....	4 7, 020	7, 520	7
Thiamin (milligram).....	1.6	1.9	18
Riboflavin (milligram).....	2.4	2.6	7
Prefomed niacin (milligram).....	25	27	8
Ascorbic acid (milligram).....	100	135	35

¹ Average is calculated using a population ratio procedure.

² 21 meals from household food supplies in a week is equivalent to 1 person.

³ Percent change calculated prior to rounding.

⁴ Adjustment made to reflect revised vitamin A value for eggs.

TABLE 2.—QUANTITIES OF FOODS USED BY HOUSEKEEPING HOUSEHOLDS, SPRING 1965 AND 1977

Food group	Average ¹ pounds per person ² per week		Percent ³ change from 1965
	1965	1977	
Milk, cream, cheese (milk equivalent) ⁴	8.76	8.34	5
Meat, poultry, fish, and other protein food ⁵	5.69	5.70	(⁴)
Meat, fish, poultry	4.58	4.78	9
Egg (fresh equivalent)	.82	.66	-19
Dry beans (dry weight)	.17	.12	-25
Nuts (shelled weight)	.12	.13	8
Vegetables ⁴	5.35	5.09	-5
Potatoes (fresh equivalent)	1.90	1.59	-17
Dark green	.22	.30	36
Deep yellow	.26	.24	-8
Tomatoes	.76	.71	-6
Fruits ⁴	3.73	3.94	6
Citrus (single strength juice equivalent)	1.22	1.71	41
Other ascorbic acid rich	.25	.31	25
Grain products (flour equivalent) ⁴	2.65	2.16	-19
Enriched or whole grain (flour equivalent) ⁴	2.08	2.05	-1
Fats and oils	.83	.70	-15
Sugar, syrup, jelly, candy	1.12	.83	-27
Soft drinks, punches, prepared desserts, ascorbic acid added (sugar equivalent)	.05	.12	144
Soft drinks, punches, prepared desserts, no ascorbic acid added (sugar equivalent)	.20	.22	11
Alcoholic beverages	.68	.94	38

¹ Average is calculated using a population ratio procedure.² 21 meals from household food supplies equivalent to 1 person.³ Percent change calculated prior to rounding.⁴ Includes mixtures and soups with main ingredient from group.⁵ Excludes mixtures, soups, and plate meals, that consist mostly of meat, fish, poultry, egg legumes or nuts.⁶ Less than 0.5 percent.

TABLE 3.—COMPARISON OF THE NUTRIENT VALUE OF FOOD USED IN HOUSEKEEPING HOUSEHOLDS IN THE UNITED STATES, BY INCOME ¹, SPRING 1965 AND 1977
[Average ² per person ³ per day]

	Income group I			Income group II			Income group III			Income group IV			Income group V		
	1965, less than \$3,000	1977, less than \$6,000	Percent ⁴ change from 1965	1965, \$3,000 to \$4,999	1977, \$5,000 to \$10,000	Percent ⁴ change from 1965	1965, \$5,000 to \$6,999	1977, \$7,000 to \$10,001	Percent ⁴ change from 1965	1965, \$7,000 to \$9,999	1977, \$10,001 to \$17,000	Percent ⁴ change from 1965	1965, \$10,000 or more	1977, \$10,000 or more	Percent ⁴ change from 1965
Food energy (grams).....	3,110	2,830	-9	3,180	2,840	-11	3,210	2,850	-11	3,280	2,890	-12	3,300	3,020	-8
Protein (grams).....	98	99	1	102	99	-3	107	99	-8	110	113	3	113	101	-10
Fat (grams).....	143	136	-5	150	136	-10	155	139	-11	160	139	-13	162	146	-10
Carbohydrate (grams).....	363	305	-16	359	307	-14	349	302	-14	354	306	-14	347	308	-11
Calcium (milligrams).....	1,080	1,010	-7	1,070	1,020	-5	1,110	1,050	-5	1,150	1,080	-6	1,180	1,210	3
Iron (milligrams).....	19	20	4	20	20	1	20	20	0	19	19	0	20	20	0
Vitamin A (units).....	6,470	8,130	26	6,700	7,950	19	7,180	6,720	-6	7,050	7,250	3	7,830	7,750	-1
Thiamin (milligrams).....	1.6	1.9	23	1.6	1.9	18	1.6	1.8	15	1.6	1.8	14	1.6	1.9	22
Riboflavin (milligrams).....	2.2	2.5	12	2.3	2.5	9	2.4	2.5	2	2.4	2.6	5	2.5	2.8	10
Panthenol (milligrams).....	23	27	15	24	26	8	25	26	4	26	26	0	26	29	10
Ascorbic acid (milligrams).....	85	135	62	90	135	49	100	130	26	110	135	23	130	155	22
Percent of households.....	22.2	21.6	-----	19.8	21.1	-----	25.4	25.4	-----	20.9	20.2	-----	11.7	11.7	-----

¹ Includes only households reporting income. Income groups for 1965 based on 1964 income after taxes, and income groups for 1977 based on 1976 income after taxes.

² The statistical average is computed using a population ratio procedure.

³ 21 meals from household food supplies in a week are equivalent to 1 person.

⁴ All calculations are completed prior to rounding.

⁵ Less than 0.5 percent.

⁶ Adjustment made to reflect revised vitamin A value for eggs.

TABLE 4.—CHANGE IN QUANTITY OF FOODS USED BY HOUSEKEEPING HOUSEHOLDS, BY INCOME,¹ SPRING 1965 AND 1977

Food group	Income group I			Income group II			Income group III			Income group IV			Income group V		
	Average pounds ² per person ³ per week			Average pounds ² per person ³ per week			Average pounds ² per person ³ per week			Average pounds ² per person ³ per week			Average pounds ² per person ³ per week		
	1965, less than \$3,000	1977, less than \$6,000	Percent change ⁴ 1965	1965, \$3,000 to \$4,999	1977, \$6,000 to \$10,000	Percent change ⁴ 1965	1965, \$5,000 to \$6,999	1977, \$10,001 to \$17,000	Percent change ⁴ 1965	1965, \$7,000 to \$9,999	1977, \$17,001 to \$26,000	Percent change ⁴ 1965	1965, \$10,000 or more	1977, more than \$26,000	Percent change ⁴ 1965
Milk, cream, cheese (milk equivalent) ⁵	7.78	7.18	-8	8.13	7.75	-5	8.96	8.25	-8	9.36	8.73	-7	9.64	10.20	6
Meat, poultry, fish and other protein food ⁶	5.25	5.86	12	5.55	5.59	1	5.75	5.48	-5	5.78	5.52	-4	5.08	6.07	(7)
Meat, fish, poultry	4.01	4.85	21	4.37	4.61	5	4.67	4.59	-2	4.76	4.68	-2	5.06	5.21	3
Eggs (fresh equivalent)	.86	.73	-15	.82	.70	-17	.82	.63	-23	.77	.62	-20	.79	.62	-22
Dry beans (dry weight)	.28	.18	-38	.22	.18	-21	.14	.11	-20	.10	.08	-25	.09	.08	-14
Nuts (shelled weight)	.10	.10	7	.11	.11	-4	.13	.15	14	.14	.14	-1	.14	.17	19
Vegetables ⁷	4.83	5.16	7	5.18	5.23	1	5.39	4.74	-12	5.58	5.06	-9	5.80	5.20	-10
Potatoes (fresh equivalent)	1.59	1.41	-12	1.91	1.62	-16	1.95	1.62	-17	2.08	1.69	-19	1.92	1.50	-22
Dark green	.29	.37	29	.22	.32	48	.21	.26	26	.20	.26	34	.19	.24	23
Deep yellow	.23	.27	21	.25	.24	-4	.25	.19	-24	.26	.24	-8	.33	.26	-20
Tomatoes	.60	.69	15	.67	.72	7	.79	.67	-15	.81	.69	-15	.93	.76	-18
Fruits ⁸	2.94	3.65	24	3.17	3.78	19	3.72	3.61	-3	4.09	4.09	(7)	4.86	4.52	-5
Citrus (single strength juice equivalent)	.83	1.66	100	.91	1.60	77	1.18	1.46	24	1.40	1.74	25	1.79	2.21	23
Other ascorbic acid rich	.14	.25	-72	.19	.31	60	.22	.26	20	.32	.41	30	.41	.47	15
Grain products (flour equivalent) ⁹	3.20	2.35	-27	2.84	2.23	-21	2.54	2.11	-17	2.49	2.02	-19	2.30	2.06	-10
Enriched or whole grain (flour equivalent) ⁹	2.70	2.26	-16	2.32	2.12	9	1.97	2.00	1	1.87	1.90	2	1.65	1.96	19
Fats and oils	.86	.69	-19	.85	.71	-16	.83	.70	-16	.82	.67	-19	.78	.69	-12
Sugar, syrup, jelly, candy	1.25	.82	-34	1.25	.85	-32	1.09	.85	-22	1.08	.80	-26	.96	.71	-26
Soft drinks, punches, prepared desserts, ascorbic acid added (sugar equivalent)	.03	.08	207	.03	.12	247	.05	.11	119	.06	.13	142	.07	.14	88
Soft drinks, punches, prepared desserts, no ascorbic acid added (sugar equivalent)	.14	.18	30	.18	.21	22	.21	.24	11	.23	.26	14	.25	.20	18
Alcoholic beverages	.22	.62	186	.38	.67	74	.81	.96	19	.94	1.16	24	.97	1.29	33

¹ Includes only households reporting income. Income groups for 1965 based on 1964 income after taxes and income groups for 1977 based on 1976 income before taxes.² Average is calculated using a population ratio procedure.³ 21 meals from household food supplies is equivalent to 1 person.⁴ All calculations completed prior to rounding.⁵ Includes mixtures and soups with main ingredient from group.⁶ Excludes mixtures, soups, and plate meals, that consist mostly of meat, fish, poultry, egg, legumes or nuts.⁷ Less than 0.5 percent.

CHANGES IN HOUSEHOLD FOOD CONSUMPTION IN THE UNITED STATES, SPRING 1965 AND 1977

(By Mary Y. Hama, Consumer and Food Economics Institute, Human Nutrition Center, Science and Education Administration)

In April 1977 the U.S. Department of Agriculture set out to conduct its most recent nationwide food consumption survey, the nationwide food consumption survey (NFCS) 1977-78. In the subsequent 12 months, a probability sample was surveyed and information was obtained from approximately 15,000 households in the 48 coterminous States. Approximately 34,000 individuals from these households were interviewed. Information was gathered on the food used by the households; the food intake of individual members of the households; and the household characteristics, such as income, family composition, education and employment of head, participation in food programs, and other factors which might affect food consumption. The previous nationwide survey was conducted in 1965-66. Today some preliminary data obtained from the household portion of the spring (April, May, June 1977) sample will be presented and compared with similar data from the household food consumption survey conducted in spring 1965.

Household data collection

For the household food section of the survey, the so-called list-recall method was used. A detailed list of foods aided the respondent, usually the person identified as most responsible for food planning and preparation to recall the foods used during the 7 days prior to the interview, their amounts, and costs. The method used to collect the household food data remained basically the same as that used in 1965-66. There was only one change which might have affected slightly the survey results. The households were interviewed at the initial contact in 1965-66, whereas households were contacted and informed about the survey at least 7 days prior to the interview in 1977-78. Information about each food used by the households was obtained in sufficient detail to enable the nutritive content of diets to be calculated.

RESULTS

Two reports based on the household data have been released to date.¹ The comments here are focused on the released data and additional data which are scheduled to be reported in the future. For the purpose of consistency, all household data in this report today are based on housekeeping households.² I will use tables and charts to high-

¹ Money Value of Foods Used in Households in the United States, 1977. Nationwide Food Consumption Survey 1977-78, Preliminary Report No. 1; "Food Costs and Practices of Households With Working Women and Elderly Persons," paper presented by R. L. Rizek before the American Home Economics Association, St. Louis, Mo., June 1979 (to be published in "Family Economics Review").

² Housekeeping households is defined as one in which at least 1 person had 10 or more meals from the household food supply during the 7 days preceding interview. Ninety-three percent of all reporting households met this criterion.

light some results: First some findings on the expense of food bought and eaten away from home, then the money value and the quantity of the foods used by the households in a week.

Expenses of food away from home

Of the money value of all food, the percentage due to food consumed away from the home, including meals and snacks, had increased from 17 percent to 24 percent since 1965. Figure 1 shows the relationship of 24 cents per dollar for food away from home to 76 cents per dollar for all food used at home, including food that was purchased, home produced, and received as gift or pay. The share for food away from home is slightly lower than the share reported from the 1972-73 Consumer Expenditure Survey conducted by the Bureau of Labor Statistics, and from certain other estimates of expenditures for food away from home. The lower share may be explained by the difference in the NFCS procedures, which:

- (1) Excluded nonhousekeeping households.
- (2) Excluded value of expense-account meals which were reimbursed.
- (3) Excluded cost or partial cost of federally subsidized meals, such as school lunches and breakfasts.
- (4) Excluded the nonhousehold population.

Since 1965 the socioeconomic and demographic composition of the U.S. population as well as lifestyles has changed. Factors such as more working females, higher household income, and easier access to inexpensive fast-food restaurants appear to have contributed to the increased percentage of the food dollar spent on food away from home.

Income was associated more strongly with expenditures for food away from home than with money value of home foods (table 1). In 1977 while there was only a difference of \$1.37 in the money value used at home per household member between the lowest income group (under \$5,000) and the highest income group (\$20,000 or more), the expenditures for food bought away from home per member varied from \$2.52 to \$6.83—a difference of \$4.31. For the lowest income level, away-from-home expenditures accounted for only 14 percent of the total money value of food compared to 29 percent in the highest income interval. Although the income groups are not comparable to those in 1965, the data for 1977 indicate a smaller relative difference for food away from home between the highest income group and the lowest.

Money value of food at home

Income appears to have been a less important factor in the money value of food at home. The average money value of food per person³ was only 20 percent higher for the highest than the lowest income group (table 2). Of particular interest is that the money value of food per person for the lowest income group, which averaged \$15.42, was comparable to those for moderately high income group. Has the food stamp program provided the boost in expanding the demand for food among the low-income households? Answers to this and other questions are being explored.

³ A person considered to eat 21 meals at home during past 7 days (based on 3 meals a day for 1 person) was used to adjust for variation among households in proportion of meals eaten from home food supplies. Average money value per person was calculated using population ration procedure—aggregate value for all households divided by aggregate number of persons in all households.

Answers to another question in the survey, however, imply that income is an important factor in food consumption. About 72 percent of all the respondents (fig. 2) evaluated themselves as having enough and the kinds of food they wanted to eat. At each successive income level, more households felt that they had enough and the kinds of food they wanted. Although most households at all levels of income were satisfied with their food, 9 percent of the lowest income group responded that sometimes or often they did not have enough to eat. Translated in terms of the U.S. population, 9 percent of the lowest income group, or 3 percent of the total population, represents several million people.

Money value of food used at home in 1977 did not appear to have kept pace with the money value in 1965, after adjustments were made for the rise in the Consumer Price Index (CPI) for food at home. The average money value of food at home per person (21 meals at home) was \$8.78 per week in spring 1965 and \$16.44 per week in spring 1977, an increase of about 87 percent. On the other hand, CPI of food at home rose 100 percent. The money value for some food items, of course, increased substantially more and others less than 100 percent. The difference in the money value of food used between the two periods appears to reflect the rise in food prices, the change in the types of foods used, and the change in the quantities of foods consumed by households.

Division of home food dollar

Table 3 displays the distribution of the home food dollar spent (purchased food plus money value of nonpurchased foods⁴ used) in 1965 and 1977. Compared with those in 1965, households in spring 1977 allocated more money to meat, poultry, and fish; fruit; and soft drinks, punches, and prepared desserts. Further breakdown of the meat, poultry, and fish group showed the greatest changes occurring in the proportion of food dollar for poultry, from 3.7 to 4.2 percent, and then for fish, from 3.1 to 3.6 percent. Soft drinks, punches, and prepared desserts accounted for the greatest increase in the portion of the food dollar.

The decrease in share of the dollar for the eggs, dry legumes, and nuts group in 1977 was accounted for by a notable decline in the share for eggs, from 2.9 to 2 percent. Households used less of their home food money for the fats and oils group, possibly reflecting an increased concern about fat in diets. The decrease was due to butter, which dropped from 1 percent of the dollar in 1965 to 0.4 percent in 1977. The proportion for margarine remained about the same. The share of the food dollar for sugar, sirup, jelly, and candy also declined.

Detailed examination of the division of the food dollar indicates that it was different among the income groups. The most income elastic, or income responsive, food group was alcoholic beverages; the next was the milk, cream, and cheese group. The share of food dollar for these groups of food increased with increasing income. On the other hand, the lower income households used a much higher proportion of their food money for eggs and dry legumes than did higher income households. Some food groups, such as grain products and fats and oils, remained virtually inelastic throughout the income distribution spectrum.

⁴ Value of food received without direct expense by a household is based on average price per pound paid for that food by survey households in the same region.

Quantity of food used at home

Much of the change in the dollar shares may be attributable to the differences in the average quantities of food used from 1965 to 1977. Consumption increased for four groups of food—meat, poultry, and fish; fruit; soft drinks; and alcoholic beverages—and decreased for milk, cream, and cheese; grain products; vegetables; eggs, legumes, and nuts; fats and oils; sugar, sirup, jelly, and candy. Comparisons between the 1955 and 1965 surveys reveal a similar pattern; that is, the changes in direction that occurred for the average quantity per person from 1955 to 1965 continued to 1977.

Usage of food groups did not always change by the same percentage or even the same direction as did the division of the food dollar (tables 3 and 4). While in most cases, a substantial increase in the quantity of food usually resulted in a corresponding increase in the proportion of the food dollar allocated to that food group, deviation in magnitude was found among some of the food group—grain products; sugar, sirup, jelly, candy; and alcoholic beverages. Consumption of the group comprising sugar, sirup, jelly, and candy declined perceptibly; but the dollar share of this group, fell much less, probably owing to a sharp rise in the price of candy. Similarly, while the quantity per person for grain products decreased, an increased use of commercially prepared products with higher prices might have lessened the impact on the dollar share.

Care should be used in interpreting these results due to a substantial change in food marketed since 1965. Quantities may have been lower in 1977 because of increases in dried food items and dried substitutes. The greater use of processed and commercially prepared foods may mean that the weight of refuse is no longer included, or that the weight of water is included in some groups. Also, in 1977 there were more enriched and fortified foods used, and they may have weighed the same as those used in 1965 but may have differed appreciably in terms of nutrients.

SUMMARY

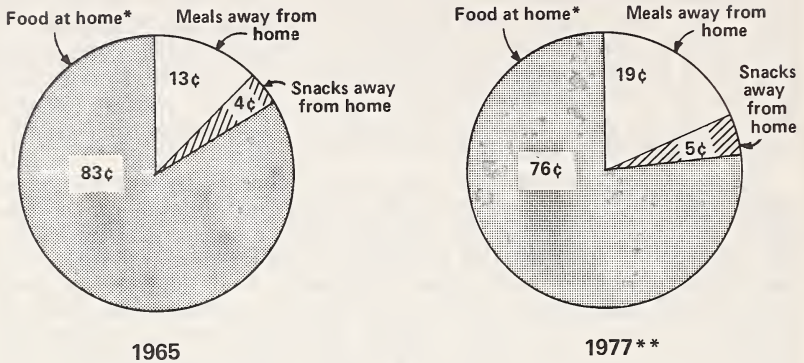
Several trends and patterns emerge from the data presented today:

Percentage of total money for food that was spent on food away from home increased from 17 percent in 1965 to 24 percent in 1977. As in 1965, households in 1977 with relatively high incomes used more of their money for food away from home than did households with low incomes.

Average money value of food used at home per person in 1977 was only 20 percent higher for the highest income group than for the lowest income group. As compared with 1965, in 1977 substantially less of the food dollar accounted for certain food groups—eggs, dry legumes, nuts; fats and oil; sugar, sirup, jelly, candy—and substantially more for soft drinks, punches, and prepared desserts.

Average quantities of foods used per person also changed since 1965. In addition to those food groups that changed in food dollar, alcoholic beverages underwent a marked change in quantity consumed. This may reflect the greater use of beer and wine, for which a larger volume intake has been typical, and to people's increased candidness in revealing their alcoholic consumption.

THE HOUSEHOLD FOOD DOLLAR, Spring 1965 and 1977



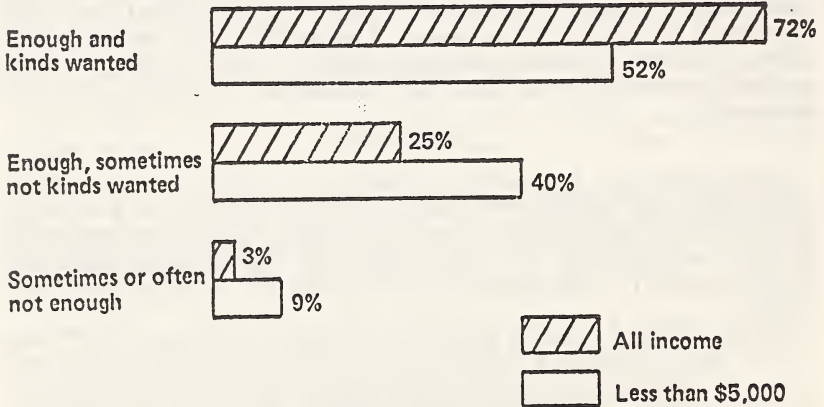
* Value of all food used at home

** USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (Preliminary)

SEA 6179-79(5)

Figure 1

SELF-EVALUATION of HOUSEHOLD, Spring 1977



USDA Nationwide Food Consumption Survey, 48 States (Preliminary)

Figure 2

TABLE 1.—MONEY VALUE PER HOUSEHOLD MEMBER OF FOOD USED IN A WEEK BY HOUSEKEEPING HOUSEHOLDS,¹ SPRING 1977

Income (1976) before taxes	People living in household ²	Money value per household member ³		
		Total	At home ⁴	Bought away from home
All households.....	3.06	\$19.91	\$15.17	\$4.74
Under \$5,000.....	2.02	17.51	14.99	2.52
\$5,000 to \$9,999.....	2.72	17.26	14.20	3.06
\$10,000 to \$14,999.....	3.21	18.50	14.15	4.35
\$15,000 to \$19,999.....	3.53	19.99	14.99	4.99
\$20,000 or more.....	3.67	23.19	16.36	6.83

¹ Household with at least 1 person having 10 or more meals from the household food supply during 7 days preceding interview.

² Excludes roomers, boarders, and employees. Average value per household member calculated using population ratio procedure—aggregate value for all households divided by aggregate number of members in all households.

³ Parts may not total to the whole because of rounding.

⁴ Includes value of food that was bought, home produced, or received as gift or pay and used by household members and guests. Value of food received without direct expense by a household is based on average price per pound paid for that food by survey households in the same region.

Source: USDA Nationwide Food Consumption Survey, 1977-78, 40 conterminous States, spring 1977 (preliminary).

TABLE 2.—MONEY VALUE OF FOOD USED AT HOME PER PERSON PER WEEK,¹ SPRING 1977

Food group ²	Income (1976) before taxes					
	All income ³	Under \$5,000	\$5,000 to \$9,999	\$10,000 to \$14,999	\$15,000 to \$19,999	\$20,000 and more
All food ⁴	\$16.44	\$15.42	\$15.17	\$15.39	\$16.04	\$18.46
Milk, cream, cheese.....	2.02	1.77	1.81	1.96	1.93	2.37
Meat, poultry, fish.....	5.64	5.50	5.11	5.22	5.82	6.32
Eggs, dry legumes, nuts ⁵.....	.71	.75	.72	.77	.64	.71
Vegetables.....	1.96	1.93	1.98	1.78	1.83	2.10
Fruit.....	1.26	1.16	1.18	1.15	1.15	1.45
Grain products.....	1.96	1.85	1.82	1.89	1.86	2.20
Fats, oils.....	.48	.46	.48	.44	.46	.51
Sugar, sirup, jelly, candy.....	.43	.38	.39	.44	.40	.48
Soft drinks, punches, prepared desserts.....	.63	.59	.63	.63	.67	.67
Alcoholic beverages.....	.61	.39	.35	.47	.82	.87
Other foods.....	.74	.64	.70	.64	.84	.78
Household size in number of 21-meal persons.....	(2.82)	(1.96)	(2.55)	(2.95)	(3.30)	(3.25)

¹ 1 person considered to eat 21 meals from home supplies during 7 days.

² Mixtures and soups included with main ingredients except those mainly meat, which are included with eggs, dry legumes, and nuts.

³ Includes households with income not reported.

⁴ Includes value of food that was bought, home produced, or received as gift or pay and used by household members and guests. Value of food received without direct expense by a household is based on average price per pound paid for that food by survey households in the same region.

⁵ Includes plate dinners with main items mostly meat, poultry, fish.

Source: USDA Nationwide Food Consumption Survey, 1977-78, 48 conterminous States, spring 1977 (preliminary).

TABLE 3.—DIVISION OF FOOD DOLLAR USED BY HOUSEHOLDS, SPRING 1965 AND 1977

Food group ¹	1965 (cents)	1977 (cents)	Change from 1965 (percent)
Milk, cream, cheese.....	12.6	12.3	-2
Meat, poultry, fish.....	32.7	34.3	+5
Eggs, dry legumes, nuts ²	5.2	4.3	-17
Vegetables.....	12.2	11.9	-2
Fruit.....	7.4	7.7	+4
Grain products.....	12.3	11.9	-3
Fats, oils.....	3.5	2.9	-17
Sugar, syrup, jelly, candy.....	3.1	2.6	-16
Soft drinks, punches, prepared desserts.....	3.1	3.8	+23
Alcoholic beverages.....	3.7	3.7	0
Other foods.....	4.1	4.6	+12
Total.....	100.0	100.0	

¹ Mixtures and soups included with group of main ingredients, except those mainly meat, which are included with eggs, dry legumes and nuts.

² Includes plate dinners with main ingredients mostly meat, poultry, fish.

Source: USDA Nationwide Food Consumption Survey, 1977-78, 48 conterminous States, spring 1977 (preliminary).

TABLE 4.—QUANTITY OF FOOD PER PERSON ¹ PER WEEK, SPRING 1965 AND 1977

Food group	Quantity per person per week (pounds)		Change from 1965 ² (percent)
	1965	1977	
Milk, cream, cheese ³ (milk equivalent).....	8.76	8.34	-5
Meat, poultry, fish.....	4.58	4.78	+4
Eggs, dry legumes, nuts ⁴	1.11	.92	-17
Eggs in fresh equivalent.....	.82	.66	-19
Legumes in dry weight.....	.17	.12	-25
Nuts in shelled weight.....	.12	.13	+8
Vegetables ³	5.35	5.09	-5
Fruit ³	3.73	3.94	+6
Grain products ³ (flour equivalent).....	2.65	2.16	-19
Fats, oils.....	.83	.70	-15
Sugar, sirup, jelly, candy.....	1.12	.83	-27
Soft drinks, punches, prepared desserts (sugar equivalent).....	.25	.34	+36
Alcoholic beverages.....	.68	.94	+38

¹ 21 meals from home supplies equal 1 person.

² Percent change calculated prior to rounding.

³ Includes mixtures and soups with main ingredient from group.

⁴ Excludes mixtures, soups, and plate dinners.

Source: USDA Nationwide Food Consumption Survey, 1977-78, 48 conterminous States, spring 1977 (preliminary).

NATIONWIDE FOOD CONSUMPTION SURVEY— IMPLICATIONS

(By D. Mark Hegsted, Administrator, Human Nutrition Center,
SEA-U.S. Department of Agriculture)

What conclusions can we or should we draw from the data available so far?

I prefer to begin by noting some of the limitations, or possible limitations, in the data so that we don't overinterpret the findings. The average household or the average person doesn't really exist. So, while average values are important and flag changes in consumption, they never tell us quite what we would like to know. If consumption of something stays the same, increases or decreases as a whole, various groups within the population can be expected to show different trends. The more the data are broken down into specifics, the more useful the information is nutritionally. On the other hand, individuals within any group will also vary substantially. We cannot monitor the intake or nutritional status of every individual, so we have to deal with groups. Whatever we conclude, the limitations of statistical data need to be kept in mind.

Although it is not very useful in helping to interpret data, it is at least worth noting that questions can be raised about the reliability of data collected in such surveys. The food supply is now exceedingly complex and becomes more so all the time. Our knowledge of food composition always lags behind our needs and always will. Some of the apparent changes in consumption may reflect inadequacies in the data base and, thus, our interpretation may change with time as the data base improves. Nevertheless, most of us believe that consumption data are a reasonable reflection of what groups of people do although we know that they do not reflect what individuals do. The average values reported here agree reasonably well with average values reported by HANES; for example, which gives us some confidence. Nevertheless, there is still relatively little hard evidence to compare what people eat with what they say they eat. Additional efforts are required to improve our methodology, although I do not expect major improvements other than, perhaps, improvements in methods to handle the information collected.

As Dr. Pao has indicated, the total food consumption of Americans—practically across the board—appears to be at a very low level. This in spite of the fact that we are as big and fat as we ever were and obesity may be gaining on us. About the only interpretation possible at this time would be that Americans are becoming increasingly sedentary. It raises many questions. Can optimal health be achieved by simply reducing food intake to control obesity? Although many people

have a firm faith in the benefits of exercise, there is little hard evidence on what is achieved by various amounts of exercise. Indeed, as will be emphasized by the report of the Panel on Obesity of the American Society of Clinical Nutrition, which should be published in December, there remains many questions about what is actually achieved by weight reducing programs even when they are successful. Obviously, for Americans as a whole, the emphasis upon weight and obesity over the past many years may have reduced food consumption but has not achieved what is thought to be desirable.

These low levels of food consumption make it increasingly difficult for many Americans to achieve the rather generous levels of nutrients specified in the recommended dietary allowances. The Food and Nutrition Board has repeatedly warned that consumption of less than the RDA does not mean an individual is deficient in that nutrient, yet we must also assume that the Food and Nutrition Board does believe that consumption at these levels is desirable. What are we to make of the proposition that the average American woman consuming a mixed and well-balanced diet cannot obtain the FDA for several nutrients? It is one thing to conclude that a proportion of any group is at risk of deficiency because of poor food choice or inadequate supplies. It is something else to define the average American at risk of deficiency.

These low levels of consumption are of interest in that recent estimates place the national food supply at about 3,500 calories per person per day. The data you have heard this morning indicate that about 2,900 of these calories actually enter the household but only 1,800 to 1,900 calories are actually consumed. Where does all of that food go? Do we really waste almost half of the total food available or feed it to cats and dogs? How much redundancy in our total food supply is required to adequately nourish our population? We can all list many factors which encourage waste—the decreasing size of families, the way foods are packaged, the way food is served in restaurants, and so forth. Yet, it should be of considerable interest to find out what actually happens. Are there 3,500 calories of edible food? If we envisage a limitation in food supplies some 10 or 20 years down the pike, there would appear to be great opportunities for conservation of food in the same way that there are opportunities for conservation of energy—the two are not unrelated.

The data are encouraging in that they indicate the spread in dollars spent for food and the kinds of food consumed at various income levels is diminishing. The programs of the past 10 years have assisted the lower income groups so that they more nearly participate in our abundant food supply. At the same time, 3 percent of all households report that they do not have enough food, and this rises to 9 percent in the low-income groups. As Ms. Hama has emphasized, this is still a lot of people and much remains to be done, especially in a country that may waste nearly half of the total food available.

Secretary Bergland has warned us that we should be very clear about the problems of the poor when we talk about food costs. It is important to note that although we continually complain about food costs and other faults of the food system, for most Americans, food costs are low compared to most of the world. Most Americans would not willingly

trade what American agriculture and our food system have achieved with that available in other parts of the world.

Incidentally, it is of substantial interest in terms of the total world food problem to note that the average calorie consumption of Americans at 1,800 to 1,900 calories per day is not greatly different from that reported in many of the developing countries where undernutrition and malnutrition are common. Yet, how many Americans are hungry? There are problems of definition as well as distribution and, again, how much redundancy in food supplies is actually needed to minimize or prevent undernutrition.

I avoided the term "malnutrition" in the last sentence because there is abundant evidence that Americans are not optimally nourished and that a major problem is excessive consumption—excessive consumption of fat, cholesterol, sugar, salt, and alcohol, as well as total calories. The latter, as I have indicated, is somewhat hard to square with the apparent level of energy consumption, obesity, and estimated energy requirements. This does not mean we are not concerned with essential nutrients but, as the papers today demonstrate, we are still caught to considerable degree in traditional methods or areas of concern. Although we are concerned and must keep watch on consumption of thiamin, riboflavin, niacin, vitamin C, and so forth, these do not represent the major nutritional concerns of the U.S. population or the major problem areas. With regard to essential nutrients, the problem areas would appear to be iron, zinc, magnesium, vitamin B6, and so forth—nutrients where there is a substantial difference between levels specified by the RDA and consumption levels. Because these are emerging interests, our data base is less adequate.

Many of the problems are obvious to all of you. These include better definition of requirements, analytical methods, problems related to bioavailability, the evaluation of nutritional status, and so forth. We now know, for example, that total iron content of the diet is probably less important than the form of iron in the diet and the nature of the diet with which it is consumed. The research effort that will be required to provide a better evaluation here is quite clear.

Similarly, comparative data from 1965 to 1977 on fat, cholesterol, salt, and sugar are less than adequate because of our shifting interests. These were not major considerations in prior surveys. Although Americans are apparently consuming somewhat less fat than previously (which is desirable), it hasn't changed much. I expect that many are actually doing better than these values indicate since it seems reasonable that a substantial amount of fat might be trimmed from meat at the table and may not be adequately accounted for in the calculations.

As you are aware, we cannot calculate sugar and salt consumption from these data. Other data on total available sweeteners indicate an increase which, when combined with a fall in total calories consumed, indicates a higher proportion of the total calories in sugar and sweeteners. This is an undesirable trend. It is worth noting that the role of sugar in dental caries is more related to the kind of product consumed and when it is consumed than the total amount consumed. The data indicate that consumption of sugar, syrup, jelly, and candy has decreased, which may be a favorable trend. It probably is due to greater

use of sugar in processed foods rather than use of sugar as such in the household. Together with an increase in soft drink consumption, I conclude we are not gaining in this area.

Increased consumption of alcoholic beverages, again combined with a falling total food consumption, is probably undesirable, although I am a believer in moderation in all things.

As I have indicated, future reports will provide a greater breakdown of the data both in terms of who eats what and the products actually eaten, which will be instructive. For example, the data available group eggs, legumes, and nuts together. This makes sense in traditional terms as good sources of protein other than meat and dairy products but is less helpful at this time. Protein consumption is now at a very high level and, in general at least, it would seem that we need not place much emphasis on protein. In contrast, there are valid reasons to encourage legume consumption—fiber, vegetable fat and the current low levels of consumption—and so more specific data will be useful. Although there are valid reasons to encourage increased consumption of dietary fiber (and we know something about sources of dietary fiber), the analytical methods available are inadequate to deal properly with this topic.

Let me end by urging everyone to recognize both the value and the limitations of these kinds of data. Statistical data can be exploited for a variety of purposes both legitimate and illegitimate and I urge everyone, including ourselves in the Human Nutrition Center, to try to use them honestly and constructively.

Finally, let me note that it is now November 1979 and the last data in the survey were collected in April 1978. Given the fact that the data were derived from 15,000 households in 48 States and also included data on 34,000 individuals who consumed upward of 20,000 different products, it is a formidable task to produce any kind of report. I want to publicly congratulate all those in the Consumer and Food Economics Institute for what they have achieved in the face of a limited staff and also tell them we confidently expect even shorter turnaround times in the future.

NUTRIENT CONSUMPTION PATTERNS OF INDIVIDUALS IN 1977 AND 1965

(By Eleanor M. Pao, Consumer and Food Economics Institute, Human Nutrition Center, Science and Education Administration)

Information on diets of individuals was obtained in surveys of statistically selected samples of households in the 48 contiguous States under the supervision of the U.S. Department of Agriculture as part of the 1977-78 nationwide food consumption survey (NFCS) and the 1965-66 household food consumption survey (HFCS). During the 1977-78 NFCS, separate surveys were also made in Alaska, Hawaii, and Puerto Rico as well as two special surveys in the 48 contiguous States, one of low-income households and another of households with at least one person aged 65 years or older (elderly sample).

In the 1977-78 NFCS in the 48 contiguous States food intake information on individuals was obtained for 3 consecutive days (except for the special elderly sample) during four seasons. In the 1965-66 HFCS food intake of individuals was collected for 1 day only during the spring of 1965. The interview—in both surveys—produced information on food used in the home during the previous week as well as information on food eaten by individual members of the household. In the 1965 HFCS the household respondent recalled the previous day's intake for all members of the household, whereas the 1977-78 NFCS participants answered for themselves whenever possible. The 3-day food intake report in the 1977-78 NFCS consisted of an interviewer-administered 24-hour dietary recall for the previous day and participants' record of food consumption for the next 2 days. The record was picked up and reviewed on a return visit by the interviewer. Foods and beverages consumed at home and/or away from home were reported. Data from interviewer-administered 24-hour dietary recall in the spring of 1965 and 1977 are available to compare nutrient intakes of children, adolescents, and adults for the two periods.

Individuals surveyed in spring 1965 numbered 14,519. In the 1977 spring survey of 48 contiguous States there are 8,661 individuals. (About 33,000 individuals participated over the four seasons of the 1977-78 NFCS in the 48 contiguous States.) Age groups for the 1965 sample differed somewhat from the age groupings for the 1977 sample as shown in the accompanying bar graphs.

Although all spring 1977 data have been processed and entered on tape, they are still being reviewed. Data from the 24-hour recalls in the 1977 survey considered in this paper are still preliminary. Differences described have not been tested for statistical significance so only a tentative assessment of the findings can be made. However, the data are useful for comparison with the many individual food intake studies

based on 24-hour recalls and the results of HANES (health and nutrition examination study) in 1971-74 by DHEW.

CALORIC INTAKE

Caloric intakes of individuals in 1977 were lower on the average than those observed in 1965 (figs. 1, 2). Mean intakes of energy for infants declined most, 34 percent. Young children, 1-5 years of age, had mean intakes that were 15 percent less than in 1965. Caloric intakes of the oldest group of men and oldest group of women (65 years and over) dropped the least between 1965 and 1977. Among the groups of younger women and girls, mean intakes were 5 to 10 percent less in 1977; for the men in similar age groups, the declines were slightly greater (10 to 15 percent).

Teenage boys, 15 to 18 years of age, had the highest caloric intake of any sex-age group in 1977, just over 2,700 kcal. In 1965, the largest mean intake of energy was slightly over 3,000 kcal, by 18-19-year-olds. Mean intakes of calories for groups of men in 1977 decreased with age from about 2,500 kcal for 19-24-year-olds to 1,925 kcal for the men 65 years and over.

Among girls and women, the highest average caloric intake in 1977 was for the group of 12-14-year-olds—1,920 kcal. The highest mean caloric intake in 1965 was 2,150 for the same age group. A general reduction in caloric intake with age occurred in 1977 except for the group of 51-64-year-old women whose intake was 1 percent greater than the younger group, 35-50 years of age.

When average caloric intakes were compared with the 1974 recommended dietary allowances (RDA), intakes for all sex-age groups were below recommendations by about 10 to 25 percent. Groups with caloric intakes more than 20 percent below the RDA for energy were: infants, boys and girls 6-8 years, boys and girls 9-11 years, girls 12-14 years, and women 19-24, 35-50, and 65 years and over.

Mean weights of people in most groups in 1977 were similar to mean weights for 1965. Thus the drop in caloric intake does not appear to be associated with loss of weight. Perhaps a sedentary lifestyle is more common in the 1970's than in the 1960's.

PROTEIN, FAT, AND CARBOHYDRATE INTAKES

Generally, intakes of the three main energy-producing nutrients—protein, fat, and carbohydrate—decreased between 1965 and 1977 (figs. 3, 4). Average protein intakes of individuals in all sex-age groups decreased or remained the same. The infants' group showed the largest decline, about 40 percent below the 1965 level. Children in the 1-2-year-old group had the second largest decrease in average protein intake—about 15 percent below 1965 intakes. Mean intakes of the older groups of children decreased less. In 1977, protein intake of girls (9 years and over) and that for women less than 65 years of age ranged from 91 to 97 percent of 1965 intakes. For boys and men of the same ages, the range was 85 to 94 percent of the averages from the earlier survey. Averages for the men 65 years and over and the women in the same group showed little over and the women in the same age group showed little change from mean quantities of protein consumed in 1965.

The mean intake of protein for infants decreased from 39 grams in 1965 to about 25 grams in 1977. This sharp drop in protein intake of infants may reflect a change in composition of baby formulas from those made with evaporated cow's milk, as was common in the 1960's, to the formulas developed to resemble human milk in the 1970's. Human milk has about one-third as much protein as cow's milk.

In addition to having the largest caloric intake, the 15-to-18-year-old boys had the largest mean intake of protein, 107 grams, in 1977. The largest mean protein intake in 1965 was 118 grams for the 18-to-19 and 20-to-34-year-old group of boys and men. Protein intakes of men in 1977 decreased with age to about 80 grams in a day for the men 65 years and over.

Among the age groups of females in 1977, girls 12 to 14 years of age had diets with the highest mean intake of protein, about 75 grams. Intakes for women 19 to 65 were about the same, 64 to 67 grams, decreasing to 60 grams for the oldest group.

Although mean protein intakes were lower in 1977 than in 1965, average quantities in 1977 were more than adequate to meet the 1974 RDA for all groups. Also, despite the reduction in average intakes of protein, the percentage of calories from protein was up slightly for all groups except infants.

Average fat intakes decreased considerably in 1977 from 1965, the difference being about 20 percent for most groups (figs. 5, 6). However, the drop for the infants' group was exceptionally large, the average being about 45 percent less in 1977 than in 1965. The reason for this large decrease is not yet known, but the data will be analyzed further. The elderly men's and elderly women's groups showed the least change, about a 6- to 8-percent decline. Average fat intakes of the groups of boys and younger men generally decreased from spring 1965 to spring 1977 a little more than the intakes for the same age groups for females. (Levels in 1977 were 80 to 86 percent of 1965 values for the groups of males and 85 to 90 percent of 1965 values for the female groups.)

In 1977 the largest mean intake of fat for any sex-age group was the 125 grams consumed by the 15-to-18-year-old boys. This quantity is markedly lower than the highest mean fat intake of almost 150 grams for 18-19 year olds in 1965. Intake was lower for successively older age groups and the average fat intake of men 65 years and over was about 90 grams. Of females, girls 12 to 14 years of age evidenced the highest group average for fat, 85 grams. Women's intakes were around 70 to 75 grams, except for older women. The average intake for women 65 years and over was about 65 grams. The percentage of calories derived from fat was lower in 1977 than in 1965 for all sex-age groups. The steep drop for infants, from 39 percent in 1965 to 29 percent in 1977, made them the only group to meet the American Heart Association recommendations that call for less than 35 percent of energy in the diet coming from fat. Fat as a source of energy in men's diets decreased from about 45 in 1965 to 42 percent in 1977, still well above the recommended amounts. A slightly greater decrease in the proportion of calories from fat appeared in the oldest women's group than in the oldest men's group. The oldest group of men had the highest proportion of energy from fat indicated by the preliminary data from the 1977 survey. Although these men have lived past 65 years of age, data

on their own appraisals of their health status have not been summarized as yet. These data will be of considerable interest because high dietary intake of fat is considered by many health professionals to be a risk factor for heart disease.

Total carbohydrate consumption for most groups fell between 1965 and 1977. Exceptions were men 65 years and over and the two oldest groups of women (51-64 and 65 years and over). (The proportions of carbohydrate coming from natural and added sugar and from starches are not available.) The decline was about 1 to 8 percent for girls and women less than 50 years of age and about 5 to 12 percent for boys and men less than 65 years of age. However, the reduction for infants (about 25 percent) was considerably greater than that for all other sex-age groups.

Boys 15 to 18 years of age had the highest mean intake of carbohydrate—about 300 grams—in 1977 compared to the high of 315 grams in 1965. The 9-to-11-year-old girls had the highest mean intake—225 grams—of all female groups in 1977, fractionally lower than the high of 235 grams in 1965 consumed by the 12-to-14-year-old groups of girls.

Even though the absolute amount of carbohydrate was down in 1977, the proportion of calories from carbohydrate was up. About 50 percent of the energy intake of infants came from carbohydrate. Around 40 percent of the energy intake of men, 19 to 64 years of age, came from carbohydrate. The proportion for women in this age range was almost the same, about 42 percent. The oldest group of men and of women obtained a slightly higher percentage of their calories from carbohydrate (42 and 46 percent) than younger adults but not as much as the children's group (48 percent).

MINERAL INTAKES

Calcium intakes were lower for infants, children, and teenagers in 1977 than in 1965 (figs. 7, 8). For most adult groups, mean intakes were close to or above 1965 levels. Increases in average intakes of calcium occurred for the oldest group of men and for the two oldest groups of women. The sharpest drop in average intakes of calcium was found for the infants, a decline of more than 40 percent. Here, as for protein, the decline may be due to the change in baby formulas from those based on cow's milk to formulas simulating breast milk which has less than one-third as much calcium as cow's milk.

Nevertheless, the mean intake of calcium for infants in 1977 was well above the 1974 RDA. Average intakes of calcium in 1977 ranged from 10 to 20 percent lower for children and from 8 to 15 percent lower for teenagers than in 1965.

The largest average intake of calcium for 1977 was for teenage boys, 15 to 18 years of age, followed closely by the intake of the next younger age group of boys. In 1977 these two groups were the only ones with intakes exceeding 1,000 milligrams of calcium, whereas in 1965 infants and boys 9 to 11 years of age also had mean intakes above 1,000 milligrams of calcium. The highest mean intakes of calcium in 1977 among female groups were found for 9-to-11 and 12-to-14-year-olds. Average calcium intakes of adults generally decreased for successively older age groups but a slightly higher average was evident in the oldest group for both sexes.

Among the 18 sex-groups, five had mean intakes of calcium in 1977 that met or exceeded the 1974 RDA for their group infants, 6-to-8-year-old children, and males 9 to 11, 15 to 18, and 19 to 34 years of age. Average intakes for the other groups of children and boys met 90 percent or more of the RDA for their group. However, females in age groups 12 years and over had mean intakes that ranged from 64 to 74 percent of the 1974 RDA. Since these are averages for age groups, we must conclude that many individuals had intakes of calcium that were much below recommended levels.

Analysis of frequency distributions or percentiles of both the 1-day and 3-day intakes of calcium will provide more insights. Despite the improvement in the calcium intake of the women 65 years and over, the calcium intakes of the other groups of females, 12 years and over, were about the same in 1977 as in 1965.

Mean intakes of iron increased in 1977 over 1965 for many sex-age groups. The increased iron intake of infants was especially dramatic, well over twice the 1965 value (fig. 9). However, the 1-to-2-year-olds in 1977 had a mean intake only half as high as that of infants. Thus, although the mean iron intake of infants was more than adequate to meet 1974 RDA, the mean intake of the group just beyond infancy (1-to-2-year-old group) was only 55 percent of the RDA. Mean intakes of the 3-to-5-year-olds more nearly met recommendations and those of the 6-to-11-year-olds exceeded them. The improvement in average intake of iron for infants is the result of increased iron fortification of baby cereals and baby formulas since the 1965 survey. The average intake masks the probable existence of some infants with low intakes and possibly some with unusually high intakes of iron because of being fed both iron-fortified cereal and iron-fortified formula. Whether the infants with high intakes were also given iron supplements is a question that can be addressed later with survey information.

In 1977 mean iron intakes of the groups of men exceeded 1974 RDA by a considerable margin. Intakes of two groups of boys were slightly below the recommendations even though their mean intakes were up. Mean intakes of females in the groups 12 through 50 years of age met about 60 to 65 percent of the RDA for their groups in 1977, practically the same as in 1965.

Magnesium intake in 1977 was somewhat less than estimates for 1965 for infants and most groups of children and teenagers. However, 1977 intakes were higher for most groups of adults, especially the oldest adult groups. Mean intakes of magnesium for children (under 9 years of age) were in the range of 150 to 220 milligrams, for older girls and women around 175 to 140 milligrams, and for older boys and men about 230 to 300 milligrams. When compared with the appropriate 1974 RDA, mean intakes for infants and 1-to-2-year-olds met recommendations and the other groups of children were only slightly below recommendations. For the groups of boys and men, mean intakes of magnesium met between 80 and 89 percent of 1974 RDA. Comparable age groups of girls and women had averages supplying 69 to 79 percent of 1974 RDA with the exception of the 9-to-11-year-old girls whose intake met 90 percent of the recommended levels. However, there is greater uncertainty in the comparisons because reliable magnesium data are not generally available for use in calculating magnesium values of diets such as those reported here.

Phosphorus consumption was calculated for the first time in 1977. Mean intakes of all groups appear to meet 1974 RDA, except for the group of girls 15 to 18 years.

VITAMIN INTAKES

Vitamin A intake for all but four groups was down in 1977 from 1965 levels, the exceptions being the 6-to-8-year-old children, the oldest group of men, and the two oldest groups of women. The decline in the mean vitamin A intake for infants was 35 percent. For the children and teenagers the difference between 1965 and 1977 was much less, ranging from 14 to 18 percent for the girls and 6 to 13 percent for the boys. The 19-to-34-year-old men's and women's groups had mean intakes for 1977 that were 25 percent below those in 1965. Although 1977 intakes were down from 1965, they were sufficient to meet the 1974 RDA for all groups. In contrast to some other nutrients in the diet, the mean vitamin A intakes for adult groups in this sample generally increased for successively older age groups, although the 51-to-64-year-old group of men had an intake that slightly exceeded the intake of the oldest men (fig. 10). It may be that the older adults are consuming more vitamin-A-rich foods such as dark green vegetables.

Ascorbic acid intakes in 1977 were considerably higher than mean intakes in 1965, with levels ranging from 20 to 80 percent over 1965 values (figs. 11, 12). Fortification of beverages and other foods with vitamin C and increased consumption of citrus fruit and juice contributed substantially to the increase.

Mean intakes of thiamin increased in 1977 over 1965 for all groups except one (19-to-34-year-old men) in which the average was nearly the same for both surveys. Mean intakes of all groups exceeded the 1974 RDA except the 19-to-34-year-old women, whose intake just missed meeting the recommended level.

Riboflavin intakes of infants and children decreased between 1965 and 1977. The mean intake for infants dropped most, almost 30 percent. Yet their intakes, when expressed as a percentage of 1974 RDA, exceeded the recommendation by more than 100 percent. Mean intakes of men and women, 65 years and over, were up, but those for the younger adult groups were down slightly from 1965 levels. Nonetheless, mean intakes met or exceeded 1974 RDA for all groups.

Vitamin B₆ intakes were higher in 1977 than those estimated for the 1965 survey except for infants, 1-to-2-year-olds, men and women of 19 to 34 years of age, and men 35 to 50 years of age. Mean intakes of infants and children in 1977 exceeded 1974 RDA but intakes of adults were below RDA. The mean intake of vitamin B₆ for men 65 years and over provided 78 percent of the RDA. For the younger groups of men, mean intakes provided 88 to 99 percent of the RDA. However, for the groups of females 15 years and over, mean intakes were only 60 to 65 percent of RDA, indicating that vitamin B₆ may be a special dietary problem for older teenage girls and women of all ages. Reliable food composition values for vitamin B₆ have been difficult to obtain because

of inadequate analytical methods and are not available for a considerable number of foods. The calculated content of the vitamin B₆ for these diets is an estimate based on the best information currently available, but the reliability is less certain than for other nutrients.

CONCLUSIONS

Comparison of the average nutritive content of the diets based on the preliminary data from the NFCS in spring 1977 with data from the HFCS in spring 1965 leads to the following conclusions:

1. Caloric intakes of all sex-age groups were lower in 1977 than in 1965.

2. Intakes of infants showed the sharpest drop of all sex-age groups from 1965 to 1977 for food energy, protein, fat, and calcium but a large increase for iron.

3. Intakes of energy, protein, and fat appear to have decreased the least in older men and women, whereas calcium, vitamin A, and vitamin C intakes were higher in 1977 than in 1965 for this age group.

4. From 1965 to 1977, intakes of protein declined for all sex-age groups except men and women over 65 years of age, and fat intake declined for all sex-age groups.

5. Calcium intakes in 1977 were lower than in 1965 for infants, children, and teenagers but were close to or above 1965 levels for six of the eight groups of adults. Average intakes of females 12 years and over were 25 percent or more below the 1974 RDA. Several groups of children and males had intakes that averaged about 10 percent below the RDA.

6. The iron intake of infants in 1977 was more than twice the intake in 1965. However, the average intake of 1-to-2-year-olds was much lower—about 45 percent below the 1974 RDA. Average intakes of females 12 to 50 years were between 35 and 40 percent below the RDA, as was the case in 1965.

7. Vitamin C consumption increased considerably from 1965 to 1977.

8. Average intakes of the following nutrients met 1974 RDA for all sex-age groups: protein, vitamin A, thiamin, riboflavin, vitamin C, and phosphorus.

9. Vitamin B₆ intakes of infants, children, and some groups of teenagers met the 1974 RDA; however, intakes of adult groups were below RDA. Females 15 years and over had mean intakes between 35 and 40 percent below the 1974 RDA. Men and girls 12 to 14 years had average intakes falling 7 to 22 percent below the standard. These conclusions must be taken with caution because food composition values for vitamin B₆ are still in the developmental stage.

10. Average intakes of magnesium were below 1974 RDA for nearly all sex-age groups but food composition values for magnesium are likewise still in the developmental stage.

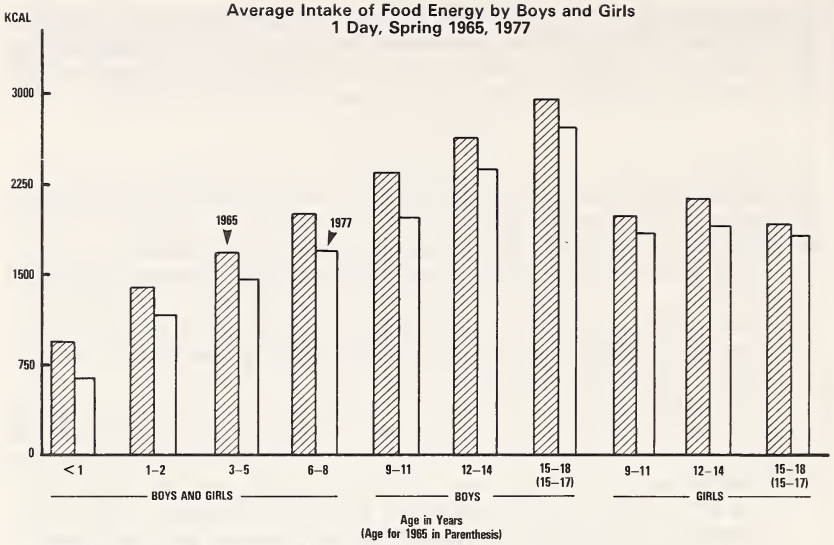


FIGURE 1

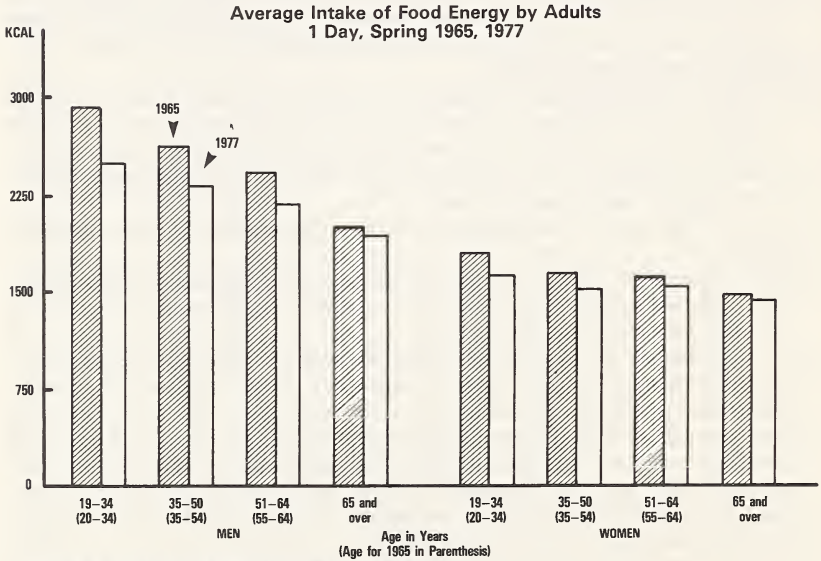
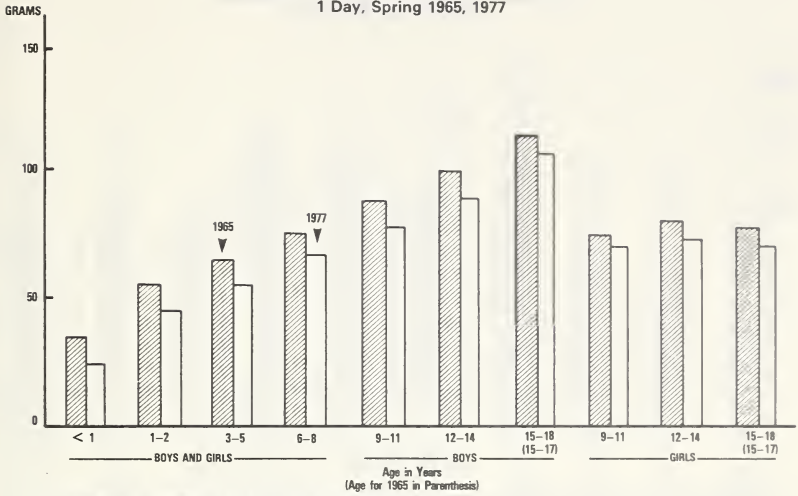


FIGURE 2

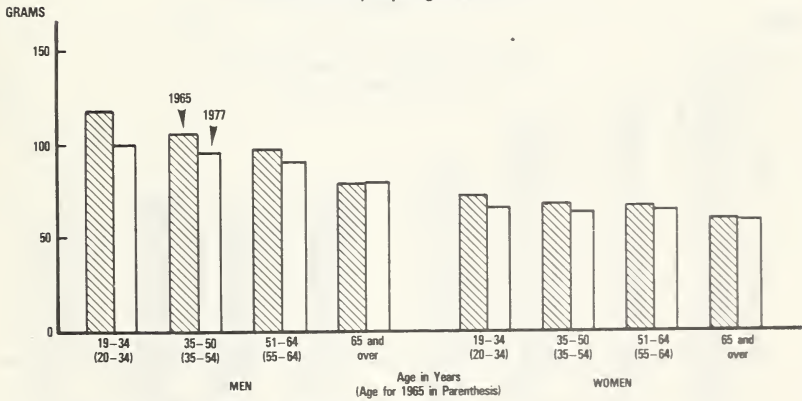
**Average Intake of Protein by Boys and Girls
1 Day, Spring 1965, 1977**



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 3

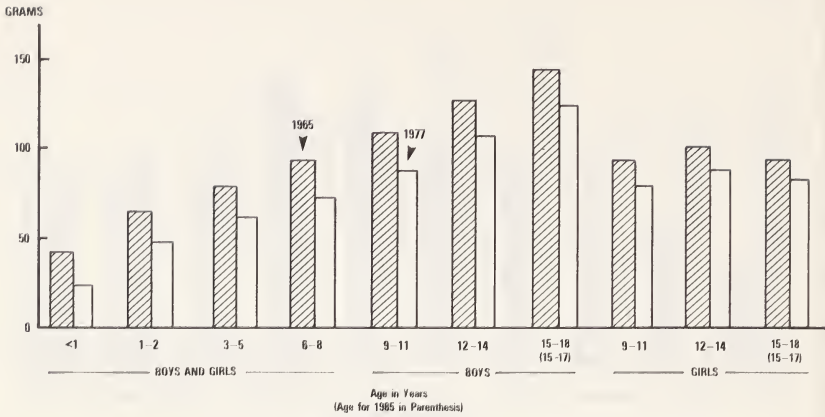
**Average Intake of Protein by Adults
1 Day, Spring 1965, 1977**



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 4

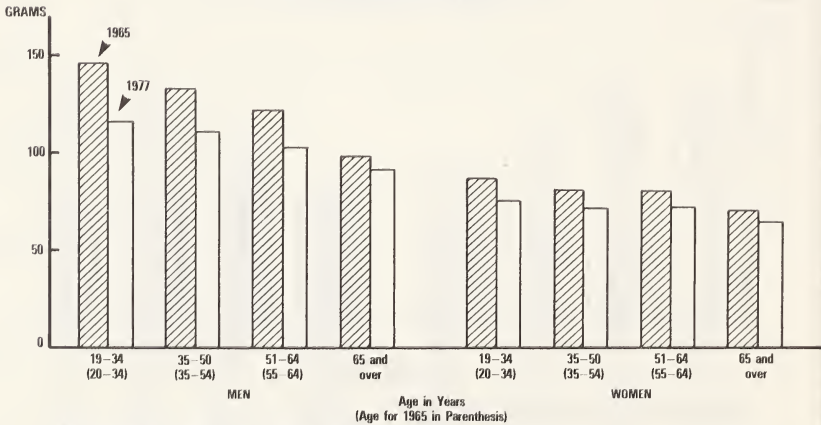
**Average Intake of Fat by Boys and Girls
1 Day, Spring 1965, 1977**



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 5

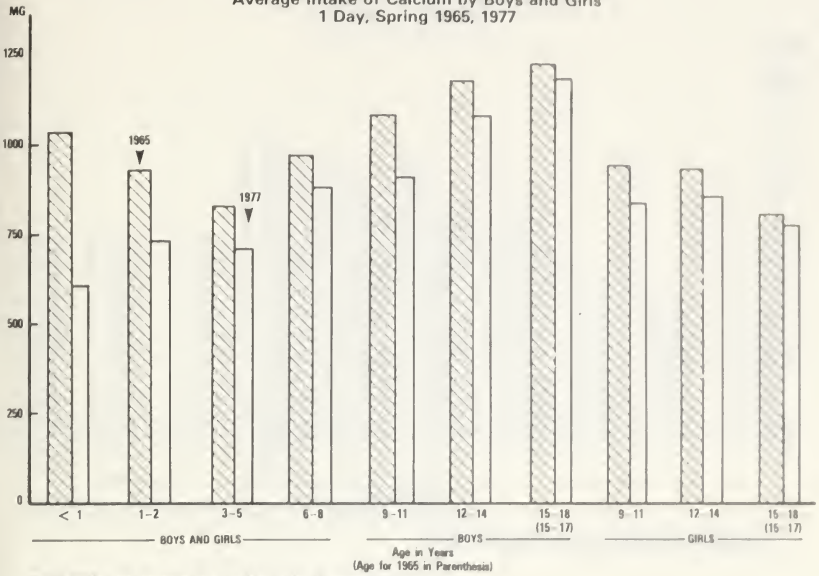
**Average Intake of Fat by Adults
1 Day, Spring 1965, 1977**



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 6

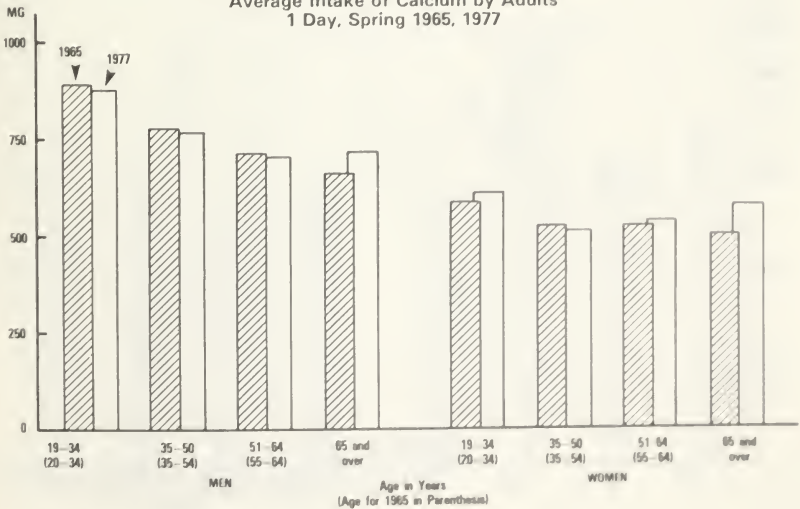
Average Intake of Calcium by Boys and Girls
1 Day, Spring 1965, 1977



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 7

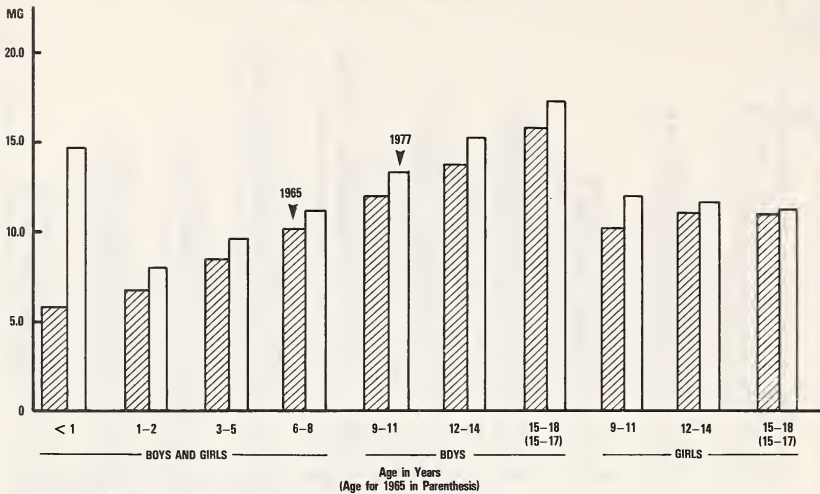
Average Intake of Calcium by Adults
1 Day, Spring 1965, 1977



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 8

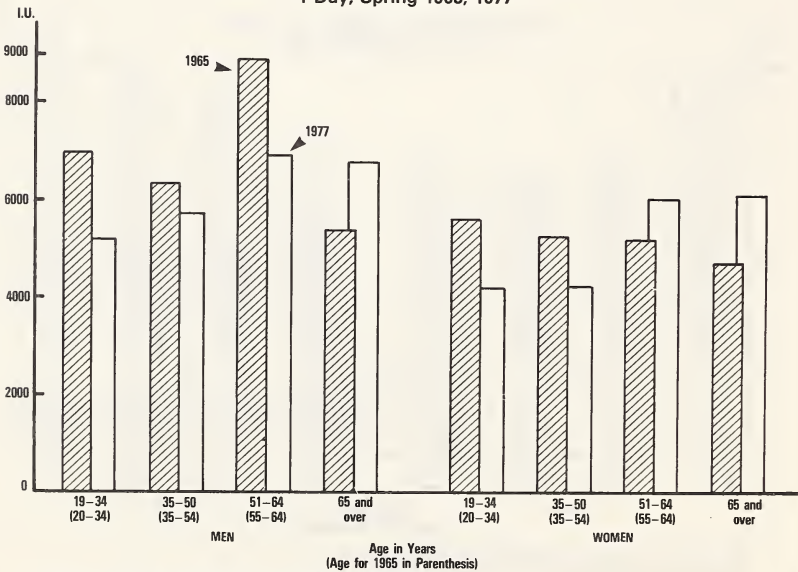
**Average Intake of Iron by Boys and Girls
1 Day, Spring 1965, 1977**



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 9

**Average Intake of Vitamin A Value by Adults
1 Day, Spring 1965, 1977**



USDA Nationwide Food Consumption Survey, 48 States, Spring 1977 (preliminary)
USDA Household Food Consumption Survey, 1965-66, Report No. 11, 1972

FIGURE 10

**Average Intake of Vitamin C by Boys and Girls
1 Day, Spring 1965, 1977**

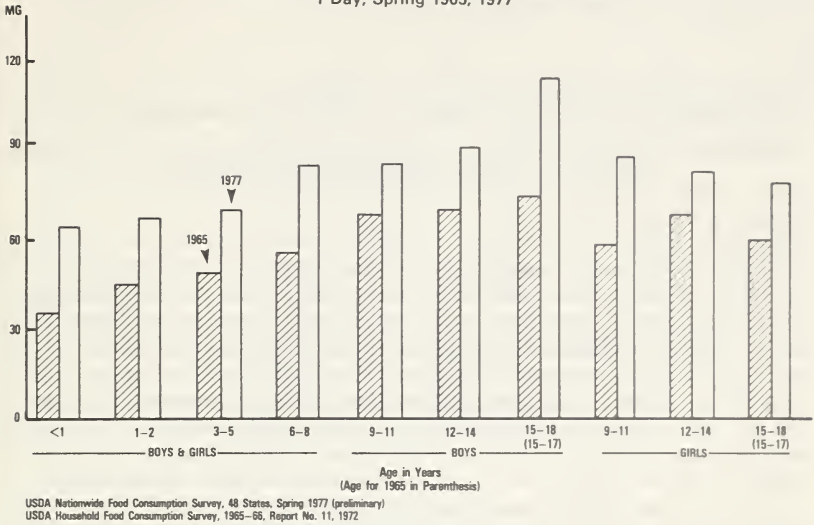


FIGURE 11

**Average Intake of Vitamin C by Adults
1 Day, Spring 1965, 1977**

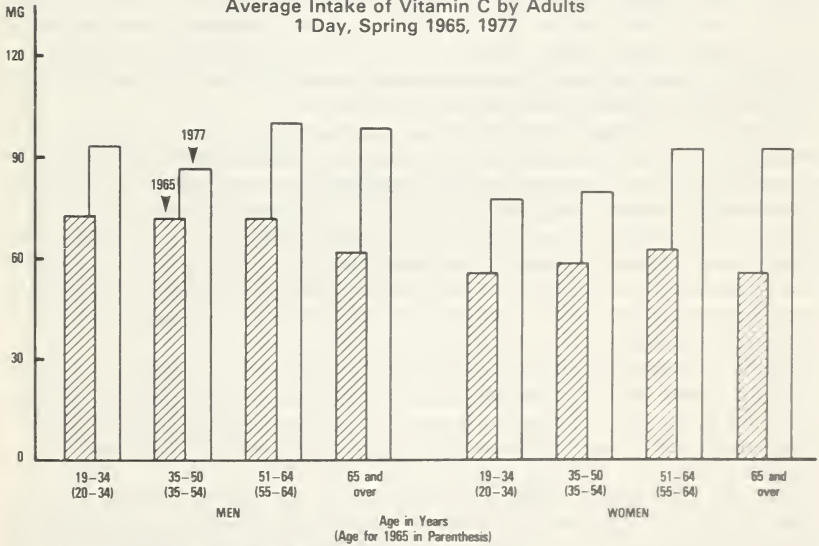


FIGURE 12

ECONOMICS OF THE FAMILY: WHO MAXIMIZES WHAT?

(By Marianne A. Ferber, Professor, and Bonnie G. Birnbaum, Research Associate,
Department of Economics, University of Illinois)

In the traditional family the husband was the breadwinner, while the wife stayed at home and baked the bread.¹ Today it is increasingly acceptable for the woman to work outside the home as well, especially before there are children, and again after they grow up. There is also evidence that the husband is beginning to "help" somewhat more with household chores.² But essentially it is still his responsibility to be the provider, and hers to be the homemaker. This presumably enables each to concentrate on what he or she does best, the family's welfare is maximized, and everyone lives happily forever after. Or do they?

There are, in reality, a number of serious problems with the simple model underlying the above conclusions. It ignores the extent to which satisfaction (and dissatisfaction) is derived from work directly, not only from the consumption which work makes possible. The family is treated as though it did not change over time, and children did not grow up and leave home. No attention is paid to the status of the individual within the family. Last, but not least, there is the implied assumption that the family is a permanent, indivisible unit. Each of these issues will be critically examined in this paper.

First, the division of labor where spouses specialize completely in market and homework respectively has the disadvantage that any type of work is likely to become less pleasant and more tedious as one spends increasingly more time on it.³ To the extent that variety is the spice of life, both husband and wife might find it more rewarding to share both types of work. Particularly, she is likely to appreciate the opportunity to get out of the house, and spend some of her time with other adults, while he may well enjoy the chance to get to know his children better.

Second, the wife who devotes much or all of her working time to the household finds the value of her contribution declining sharply as children grow up and require less care. At that time she may well consider reentering the labor market.⁴ But during the years she was a

¹ What is viewed as the "traditional family" today actually has a rather brief history. In the days before industrialization most production took place in family enterprises, small shops, businesses, and particularly farms. While there was some specialization, the husband perhaps raising grain and looking after cattle, while the wife grew vegetables and took care of chickens, she was nonetheless a partner, not a housewife in the modern sense. This is still true to a degree of farm women today, but less so with the disappearance of mixed farming.

² John P. Robinson, "Changes in Americans' Use of Time, 1965-75: A Progress Report." August 1977.

³ Although housework, and often market work as well, is itself heterogeneous, the differences between market and housework tend to be far greater than those within either category.

⁴ The term reentry is used because the great majority of women today were in the labor market before their first child was born.

full-time homemaker her labor market skills became rusty. It may now be difficult for her to find work, let alone an interesting and well-paid position. The seriousness of this problem will vary according to occupational category, and the length of absence from the labor market. In any case, however, the wife who stays home when the children are young is far less likely to maximize family well-being in the long run, over the whole life cycle, even if she does so in the short run, during the early years of marriage.

A recent study of lifetime earnings of clerical workers with various patterns of labor force participation⁵ indicates that a woman with two children and a high school education reduces her lifetime earnings by about 29 percent by dropping out of the labor market for 10 years. The comparable figure for a college graduate is 32 percent.

The losses in earnings are partially offset by the greater value of housework of the woman while she is out of the labor market. Using data from Robinson⁶ to determine the difference in time spent, and census data on earnings of housekeepers (with the same level of education as the woman concerned) to estimate the value of that time, we find that the total lifetime contribution of the high school graduate is nonetheless 18 percent lower, and of the college graduate 21 percent lower when she interrupts employment for 10 years.

The same study found that the total lifetime contribution of a high school graduate who leaves the labor market permanently after the birth of her first child is reduced by 57 percent compared to one who never leaves the labor market. The comparable figure for a college graduate is 50 percent.

The above estimates are based on a single occupational category, and would clearly vary for other occupations. Since the earnings profiles of clerical workers are relatively flat as compared, for instance, to most professionals, these estimates are rather conservative. The number of children would also influence the size of the gap, as would other individual variations in lifestyle. But there can be no doubt that the woman who continues to work outside the home makes a far larger contribution to the real income of the family, calculated as money income plus the market value of housework, than does the woman who spends any significant number of years as a full-time homemaker.

Third, in the family where the husband is the sole wage earner he is generally also the dominant decisionmaker. The wife with no money income of her own is less likely to have her own charge or bank accounts, has less say on when and how money is to be spent or where the family is to live.

From the wife's point of view it is also particularly unfortunate that the value of the homemaker to her family peaks at an early stage of the life cycle. A woman in her forties or fifties may well ask herself what she has done for her family, lately. Worse than that, she may begin to wonder whether the same question is on their minds. During

⁵ Earnings of clerical workers with various patterns of labor force participation are reported in Marianne A. Ferber and Bonnie G. Birnbaum, "Labor Force Participation Patterns and Earnings of Clerical Women," unpublished paper, 1979. Estimates of the value of the total contribution to the household of women with different patterns of labor force participation are reported in Marianne A. Ferber and Bonnie G. Birnbaum, "One Job or Two Jobs: That Is the Question," unpublished paper, 1979.

⁶ John P. Robinson, "How Americans Use Time: A Socio-Psychological Analysis of Everyday Behavior," Praeger Publishers, New York, 1977.

these years the husband's earnings typically continue to increase, especially if he is in management or one of the professions. The relationship becomes more and more not one of two partners but that of the head of the household and a wife dependent on his economic contribution. It is easy to see what such a situation may do to her own perception of self-worth, and her status within the family.

This brings us to the fourth and most serious problem: The dependent homemaker who must suddenly fend for herself. The great majority of wives are sooner or later left without a husband, whether because of separation, divorce or death. Others find themselves in a position, temporarily or permanently, where they have to try to support a husband who is unemployed or disabled. Such women, and their dependents, almost invariably find themselves faced by a severe reduction in their standard of living, and are frequently confronted by dire poverty. The most common case is that of the divorced woman, generally with children, who collects little if any alimony or child support and rarely manages to improve her economic status significantly except through remarriage.⁷

The husband, too, is disadvantaged when he has done virtually no housework previously and must suddenly manage on his own. Since courts frequently do award alimony to a wife who is unable to support herself, he may also feel that financial pinch if he is one of the conscientious minority, or at least be inconvenienced by the legal maneuvers that are necessary to avoid making the payments. Nonetheless, his earning power remains the same and his work goes on as before, so that he is far less vulnerable than the woman who becomes a displaced homemaker.

In addition to the disadvantages to the couple of such specialization, there are costs to the taxpayer as well. The loss of job experience and depreciation of skills which accompany the long-term absence from the labor market make it difficult for a woman to support her family, should the need arise. Hence female-headed families constitute a substantial proportion of families in need of public support.⁸

On the basis of all these considerations we must conclude that complete specialization by husband and wife in market and housework respectively will not necessarily achieve optimal results for society, the family, or the husband. It is, however, the wife who most of all faces disadvantages and potential risks. She is deprived of the opportunity to lead what many consider a richer life by having more varied work experience. While there are those who prefer full-time homemaking, and while some market jobs are dull, monotonous, or even unpleasant, many nonetheless find the more varied work experience when they enter the labor market more rewarding. Wives who stay home also fail to maintain or acquire skills which would enable them to make a greater contribution to family income during the long years when there are no small children in the home. In addition, the wife is at a disadvantage vis-a-vis the husband with regard to status and power within the family when her contribution to the household is relatively

⁷ According to the Census Bureau Report "Divorce, Child Custody, and Child Support," series P23, the amount of child support paid to most women is small: two-fifths received less than \$1,000 during 1975 and three-fifths less than \$1,500.

⁸ Heather L. Ross and Isabell V. Sawbill, "Time of Transition: The Growth of Families Headed by Women," Urban Institute, 1975.

small and when she is far more economically dependent on her husband than vice versa. She may have to remain in a unhappy marriage, and will be in an extremely vulnerable position if she has to fend for herself, and often for her children as well.

Thus it is hardly surprising that women increasingly reject the traditional housewife role, and continue to enter the labor market in ever larger numbers. More than half of all married women with husbands present today work outside the home.⁹ It is perhaps more puzzling why almost half of them still opt for full-time homemaking. The explanation must be sought by examining the situation of the husband as well as the wife, since both influence the division of labor within the household.

As mentioned earlier, it is the woman who has the responsibility of looking after the household and caring for the children, whether or not she is in the labor market. Table 1 shows the total workweek—market work plus home production (child care and housework)—of a mother of two children who is employed 40 hours a week.¹⁰ This estimate also includes an additional 5 hours a week of commuting time. The total time spent varies by age and by level of education, but the estimates are in the range of 71–83 hours per week, or approximately double the standard workweek. Moreover these totals tend to be downward biased, in that child care time was counted only when it was a primary activity. Hours spent when the wife was primarily engaged in a leisure activity, but also looking after the children are not included.

The burden of this double load can be reduced somewhat by substituting more goods and services purchased in the market for home production, for example, switching to prepared foods, restaurant meals, and hired help for cleaning and child care. Planned spacing of children to accommodate the mother's work plans is also helpful. But so long as it is the wife who is, in the last analysis, responsible for the functioning of the household, and the mother who must cope with childhood illnesses, unreliable help and other domestic emergencies, the dual role will continue to present a formidable challenge for her. Not all women have the determination, stamina, and good health required to cope with this.

The husband does not face these problems. He does little or no additional housework when the wife enters the labor market, and stands to gain from the additional income and financial security a second wage earner provides. Nonetheless, we find that men have a consistently less favorable attitude toward women working in the labor market than women do. According to data collected on young Midwestern couples, 92 percent of the women, but only 60 percent of the men agreed that the wife should work if the family needs money. Sixty percent of women, and 82 percent of men agreed that if there are young children the wife should not work unless there is serious financial need.¹¹

⁹ It is often suggested that inflation is an important factor causing women to work outside the home, since higher prices have reduced real income. There are certainly cases where this is so. But, on the whole, real earnings of men have not declined over time.

¹⁰ Data based on Robinson, 1977.

¹¹ Marianne A. Ferber, "Labor Market Participation of Young Married Women." Unpublished paper, 1978.

We can only speculate why this is so. It may be that the husband values the services he gets from the full-time housewife very highly. He may object to the small amount of additional household work he does, or resent feeling guilty because he does not do more of it. More than likely some husbands also regret the loss of their dominant position. Whatever the reason, it is clear that women cannot always count on moral support from their husbands, any more than they can count on their willingness to undertake a more or less equal share of housework. As long as this is so, they are confronted not with a choice whether to do housework or marketwork, but whether to do marketwork in addition to housework.

TABLE 1.—HOURS PER WEEK SPENT IN HOME PRODUCTION PLUS 40-HOUR MARKET WORKWEEK FOR MARRIED WOMEN WITH 2 CHILDREN¹

High School graduate, 1 child born when mother age 23, 1 when she is 25		College graduate ² 1 child born when mother age 25, 1 when she is 27	
Age	Hours worked per week	Age	Hours worked per week
23 to 24	73	25 to 26	76
25 to 28	78	27 to 29	81
29 to 39	71	30	83
		31 to 39	74

¹ Home production time estimates based on John P. Robinson, *How Americans Use Time: A Social-Psychological Analysis* Everyday Behavior. To the standard 40-hr market workweek we have also added 5-hr a week commuting time.

² The higher number of hours worked by college graduates is entirely due to more time spent on child care.

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DISPLACED HOMEMAKERS: CRITICAL NEEDS AND TRENDS (A SUMMARY REPORT WITH SPECIAL EMPHASIS ON THE RURAL DISPLACED HOMEMAKER)

(By Cynthia E. Marano, Baltimore New Directions for Women, Inc., National Displaced Homemakers Network)

Who are displaced homemakers? At least 4 million former homemakers across the United States now answer to the term coined in California in 1975 to describe the middle-aged woman "forcibly exiled" from her role as wife and mother and struggling to find a place in the current job market.¹ Displaced homemakers become displaced through divorce, separation, widowhood, disability of their spouse, and through termination of public assistance which allowed them to remain homemaker until their children reached 18.

With women on the average living 8 to 10 years longer than their spouses and with the escalating divorce rate (internationally highest in the United States with nearly 1 of 2 marriages ending in divorce) the number of households headed by displaced homemakers is growing rapidly. Socialized to believe that marriage would provide financial and emotional security "till death do us part," most displaced homemakers come to middle age unprepared for the transition to family breadwinner and head of household which often faces them. Most are ill-equipped to integrate readily into the competitive job market of the seventies and eighties, a job market for which high unemployment, changing occupational outlook, sex and age discrimination, and a standard reliance on prior paid work experience and/or recent educational credentials as minimum criteria for hiring are the norms.

The difficulty making this transition becomes a grueling reality very quickly to most homemakers, however. Regardless of their former economic status, displaced homemakers move rapidly into poverty. In a survey done of programs for displaced homemakers nationally, the Displaced Homemakers Network discovered that the annual income level for displaced homemaker-headed families rarely exceeds \$5,000 after displacement.² Many displaced homemakers experience 10 to 100 unsuccessful job applications and interviews before being hired for low paid, dead end jobs.

Like most women who work outside the home, displaced homemakers usually have to work to support themselves and their families. While societal stereotypes still create images on television and in the movies of the gay divorcee who has taken her former husband "to the

¹ Women's Bureau of the U.S. Department of Labor. 1979 analysis "Women in Population" based on Survey of Income and Education. Bureau of the Census.

² Survey of Displaced Homemaker Programs. Displaced Homemakers Network, Inc. 1979.

cleaners" and the rich widow whose bankroll skyrockets through insurance, the true picture is far more grim. Less than 14 percent of divorcing women are ever awarded alimony in divorce settlements nationally. Fewer than 7 percent ever collect it regularly. About 46 percent of divorcing mothers are ever awarded child support, and it is a national disgrace that far less than half that number receive those support moneys on a regular basis, regardless of State and Federal mandates to the contrary.

In coining the term "displaced homemaker" in 1975, Tish Sommers, a California-based organizer and advocate of older women, brought the picture of displaced homemakers into focus for the first time. Since that time, through the efforts of the National Alliance for Displaced Homemakers (founded by Sommers and Laurie Shields to pass legislation in the States and nationally to provide moneys for programs aimed at getting jobs for displaced homemakers) and the Alliance's successor, the Displaced Homemakers Network, Inc., a coalition of nearly 300 displaced homemaker programs, and more than 1,000 displaced homemakers and other supporters, the portrait continues to take shape.

The needs of displaced homemakers are critical. They have been documented in hearings held around the country before State legislatures, the U.S. Congress, in numerous media reports, and in the programs which have been designed nationally to address them.³ The major areas of need are:

1. *The need for assistance with personal difficulties*

Before any progress can be made toward gainful employment, some progress must be made toward achieving a personal concept of self-worth. Many displaced homemakers devalue all of their past experience and fail to recognize any marketable skills they might possess. These women must attempt to deal with personal feelings of anger, failure, and guilt. They are likely to feel powerless, tense, desperate, isolated, and alone, feelings which are intensified by the cumulative effect of trying to deal with several crises at once. Sudden singleness and drastic reduction of income reinforce their feelings of inadequacy and strain their capacity for coping.

2. *The need for assistance with changing lifestyle*

The income of displaced homemakers rarely surpasses the poverty level, regardless of their former circumstances. The problems encountered are uncollectible alimony or child support, inability to find paid employment, and the need to pursue training before employment can be sought. Women needing AFDC or food stamps are terrified at the thought of dealing with a social service agency for the first time. Widows are frequently in danger of losing their homes and are faced with crucial business decisions with limited economic resources. Assistance in identifying and accepting available services is a real need across the Nation.

The attitudes of the majority of persons in rural areas are conservative and traditional with regard to family issues. Residents expect individuals and families to handle their own problems. If widowed, the

³ One example is a special issue of the *Journal of Home Economics* (summer 1979) in which articles appear authored by Tish Sommers, Laurie Shields, Yvonne Braithwaite Burke, Dr. Herma Williams, et al.

displaced homemaker is expected to be self-sufficient after a proper period of adjustment. If separated, divorced, or deserted, the displaced homemaker is often ostracized. Assistance in this adjustment process is a job-related need for displaced homemakers.

3. *The need for assistance with economic problems*

The displaced homemaker is often on the brink of financial disaster. Economics of the situation, age of children, property owned, et cetera, often exempt the individual from being eligible to receive certain types of assistance. The typical displaced homemaker lacks employable job skills, due to the fact that (1) no previous employment outside the home has been practiced or (2) job skills accrued earlier in life are now outdated. Skill levels are such that prospects of employment are at minimum wage or less.

The employment picture in general is one where competition for jobs is high, but the situation is even more profound in regions that are primarily agricultural or rural. Considering the combination of poor employment prospects and age and sex discrimination, the job search is often a harrowing experience for the displaced homemaker. She may easily join the ranks of "discouraged" workers—those who want a job but are not looking because they believe they cannot find one. Women comprise two-thirds of this category nationally.

Since most women are channeled into low status, low paying, dead-end jobs, they need to learn how to break the pattern. (Half of all women workers are concentrated in 17 occupations, while half of all men workers are concentrated in 63 occupations. The five largest occupations for women are secretary, retail sales clerk, bookkeeper, elementary school teacher, and waitress; these employ one-fourth of all women workers.) The pattern can be broken both through widening occupational choices and through careful financial planning. Assistance with both is needed by displaced homemakers.

4. *The need for job-readiness skills and occupational investigation*

The displaced homemaker needs to examine her past in order to build for the future. Job readiness for most displaced homemakers means a recognition of the skills acquired during homemaking, volunteer experience, education and previous paid work experience, combined with an understanding of how to market these skills in the current job market. To accomplish these two goals, assistance is needed in skills identification, occupational investigation, and job search techniques.

The displaced homemaker needs to know labor market conditions, employers who are expanding or cutting back, job skills in demand, and the scope of current job training programs with potential for women. She needs to know where entry level jobs may lead to upward mobility and which employers are serious about affirmative action. The woman with child care requirements must know about alternative working arrangements, such as job sharing and flexitime. She needs help in pulling together her marketable skills and must learn how to present them to a potential employer in a highly competitive job market.

5. *The need for education and training opportunities*

The more than 300 displaced homemaker programs in the United States are founded on the principle that displaced homemakers benefit

from increased education and training opportunities. The typical displaced homemaker is often unaware of training options available. The need exists to help identify the interests of the displaced homemaker and relevant training possibilities that could maximize her chances in the labor market.

Training programs need to be developed to prepare displaced homemakers for positions in those fields which offer greater opportunities for better pay and upward mobility. There exists the need to prepare displaced homemakers for technical positions in nontraditional fields, areas traditionally dominated by, and in some cases, limited to men. Jobs in construction trades, skilled crafts, and occupations in science, law, engineering and medicine have been considered nontraditional for women. These occupations generally offer more opportunities for better pay and upward mobility than do many traditionally female jobs.

Relationships need to be established with existing training institutions to provide displaced homemakers with easier access to training programs. The training exploration process needs to include research into opportunities offered by:

CETA.

State Department of Vocational Education at vocation-technical schools and community colleges.

The work incentive program.

Union apprenticeship programs.

Nonunion skills training or apprenticeship programs.

Private vocational schools.

Title XX sponsored senior citizen employment training programs.

6. The need for job development

An essential component of the displaced homemaker programs must be job development. Training alone will be of little value if there are no jobs to fit the training or if displaced homemakers are excluded from the jobs that exist. Many employers are extremely reluctant to even consider an applicant who has had little paid work experience and who is an older woman.

Personal contact is needed with employers in the public and private sectors to make them aware of the potential job force that the displaced homemaker population represents. There is also the need to identify current and future openings an employer might have and to be aware of future employment trends.

In this paper, however, the authors want to look closely at the rural displaced homemaker and how her needs are complicated by her rural environment. Because if displaced homemakers generally face a world of severe barriers to self-sufficiency, the rural displaced homemaker faces a seemingly impenetrable wall, and her needs must be documented and dramatized before the portrait will impact on Government funding and program development.

THE RURAL DISPLACED HOMEMAKER

The typical rural displaced homemaker is close to 40 years old, having married earlier than her urban counterpart. She has an 11th

grade education and has two children who look to her for sole financial support. She has an income of about \$375 per month on which she must maintain her family, often the result of public assistance until her children are 18. She has an older model car, often needing repairs. She is divorced. She usually needs training to enter the job market or, if employed, is generally underemployed in a low paying, dead end job and is not making enough money to support her children without assistance. Any crisis can cause her financial collapse, such as the car needing repair or critical home repair.⁴ She lives in an isolated rural setting in a home that is deteriorating and has no access to public transportation.

As a rule, the rural displaced homemaker lives in a state of fear and anxiety awaiting the next emergency. She feels a sense of hopelessness and sees her life as a series of unsurmountable problems and inadequate finances.

In many ways the problems facing the rural displaced homemaker are even more social than economic. There is still a social stigma attached to being a divorced or separated woman in a rural setting that is greater than that felt by the city dweller. The attitudes of the majority of persons in rural areas are traditional with regard to family issues. As mentioned earlier, individuals and families are expected to handle their own problems.

The displaced homemaker has often been dedicated totally to the survival of her family. She feels she is not supposed to ask for help—that she is supposed to “keep it in the family” and somehow put her life together again without help from professionals, who even if she sought help are at a great distance.

Women in this situation frequently lose friends and the support of their families when divorcing. The rural displaced homemaker carries not only her own feelings of anger, failure and guilt, but having internalized her community's values, she sees herself as doubly guilty. And this double guilt is reinforced by the community's reaction to her. The welfare agency, for example, often reflects the traditional values of the community and has been known to use every legal means possible to delay or reject a woman's application for assistance.⁵ A displaced homemaker who is a newcomer to the area may be tolerated but not welcomed. There is pressure to maintain the community as is and pressure not to accept those who do not fit in.

In the rural and isolated communities of Maryland, for example, often the State's pockets of most severe unemployment, the displaced homemaker's situation is often of crisis proportion. According to a June 1979 report by the Department of Human Resources of the State of Maryland, unemployment in western Maryland and the Eastern Shore averaged 7.6 percent, a significantly higher rate than the 5.8 percent average for the entire State. On the upper Eastern Shore, a rural area, the average number of families with incomes less than poverty level is approximately 14 percent compared to only 8 percent for the State of Maryland.⁶

⁴ Michael and Jettalee Grimes, “The Displaced Homemaker in a Rural Area,” 1st edition, Pierce County, Wash., 1978.

⁵ Loretta Novak, “Barriers Unique to the Rural Displaced Homemaker,” Displaced Homemakers: Program Options, Baltimore, Md., 1978.

⁶ Maryland Employment Directions—1985, supplement No. 2, Balance of State Areas, Maryland Department of Human Resources, 1978.

Very few industries in such a setting employ more than 100 people. In small towns, heads of households typically commute more than 10 miles from home to find employment—even 50 to 60 miles to find adequately paying jobs, a figure greatly increased in the western States. The prevailing wage rate is minimum wage and lower. Many of the jobs available are owned and managed by the same community members who have effectively ostracized the displaced homemaker socially. Favoritism is common.⁷

The cost of living is of real concern. Living in the country is not cheap despite our stereotypes. Although real estate and housing costs are lower than in a typical metropolitan area, this lower cost is offset by higher food, medical, and service costs. Fewer consumers and lower volumes increase the cost of providing food and utility service.

The biggest problem to the rural displaced homemaker is transportation. No means of public transportation exists in the five county area designated as the upper Eastern Shore of Maryland, for example.⁸ Limited transportation exists in other Maryland rural counties. Compounding the difficulty of transportation is the fact that major services are centralized in county seats, often requiring extensive travel to receive services. Rural women who have cars cannot afford repairs and insurance; they can barely afford gasoline and license plates. The rural displaced homemaker cannot afford a car until she gets a job and she cannot get a job without a car.

Obtaining adequate day care is a nightmare for the rural displaced homemaker returning to work. Day care centers subsidized by public funding are viewed as disruptive to family unity. "Besides," as opponents claim, "your children are your responsibility. You can't expect anyone else to take over your responsibility."⁹ In rural areas there are occasional day care facilities. However, it often takes as much time to find suitable day care for children as it takes to find a job.

The educational needs of rural women have received inadequate consideration. Rural displaced homemakers often have little or inadequate formal education. According to a recent research report, only 55 percent of women 25 years and older and living in nonmetropolitan areas have completed high school or one or more years of additional schooling. This compares with 65 percent of the women in metropolitan areas.¹⁰ Elementary and secondary schools often do not incorporate rural values into the curriculum and do not recognize the role of rural women in developing and maintaining those values.

Rural areas typically have fewer and more costly health services than urban areas. Disease and mortality rates are higher for rural people than for the population at large, and physicians are more sparsely situated. Rural areas also have a disproportionately large share of the Nation's elderly, who often need more medical attention than younger people. Only 12 percent of the physicians, 18 percent of the nurses and less than 4 percent of the psychiatrists live in rural areas. Medicare and medicaid do not pay the full cost of health services to poor and do not reimburse clinics in rural and urban areas at the same

⁷ Loretta Novak, see above.

⁸ *Statewide Displaced Homemakers Proposal*, Chesapeake College, Wye Mills, Md., 1979.

⁹ Loretta Novak, see above.

¹⁰ "Rural Education and Rural Labor Force in the 1970's," Department of Agriculture, 1978.

rate for identical services. Private insurance coverage is often complicated and insufficient. Special services for women are notoriously lacking. Where adequate health services do exist, they are often either inaccessible or plagued by the perception that if a doctor were any good he/she would not be practicing medicine in a rural area.

Despite recent gains in national consciousness about the rights of women, rural women continue to suffer unequal treatment under the law. Some of the new nondiscrimination laws—in employment, education, credit, housing, and public accommodations have yet to be enforced in rural areas. Of particular concern to the rural displaced homemaker are the property and inheritance tax laws. Inheritance tax laws provide that where property is jointly owned by husband and wife, upon death of a spouse, the surviving member must pay a death tax on the full estate unless it can be proved that the survivor contributed in actual dollars to building the estate. The following illustrates the dilemma that rural displaced homemakers face when a marriage is dissolved or a spouse dies.

John and Norma Norris were married in 1950. They lived on a farm in Illinois which John had inherited before they were married. At first, Norma was a housewife, caring for their children, performing the usual household tasks, gardening, preserving large quantities of food and cooking five or six daily meals for the hired hands who worked on the farm. Later on, when the children were in school, Norma took on an outside job. She continued to do the traditional tasks, and in addition contributed part of her income for family expenses.

After 22 years of marriage, John divorced Norma. The court awarded her no alimony. Her share of their marital property consisted of only her own clothing and personal effects, a few household items which she owned prior to the marriage, and an automobile which she had purchased in her own name with her own funds. The house and furnishings, the farm with its machinery and livestock, the savings—all went to John.

Norma appealed the decision. "Surely, after 22 years of hard work, I am entitled to at least a portion of the assets I helped to accumulate," she thought. But the legal system saw things differently. The appellate court upheld the lower court's division of the property.

A spouse seeking part of the other spouse's property, explained the court, must show that she or he made valuable contributions to the property's worth. The court defined a valuable contribution as "money or services other than those normally performed in the marriage relations"; Norma's years of cooking, cleaning and childrearing did not meet the court's definition of "valuable."¹¹

Or this letter from a rural widow:

When Floyd died, the law said everything was his. They gave me half as a widow—I paid on the rest. I owed \$40,000 but I had to dig up more. I pay over 10 years. Cattle prices are disastrous, now corn prices the same. I am going deeper in debt all the time. I don't know how much longer I can go on borrowing.

I worked with Floyd for 33 years for my board and room. It was all right with me. I had the idea that what was his was mine and what was mine was his. We were putting all our money back into the place and improving it. Now, the inheritance tax may be the final straw to make me lose it.

¹¹ "Real Women, Real Lives: Marriage, Divorce, Widowhood," Wisconsin Governor's Commission on the Status of Women, 1978, p. 44.

ADDRESSING RURAL NEEDS

About 20 percent of the displaced homemaker programs in the United States provide services to rural displaced homemakers. To date, little has been written about these efforts, the program models they have developed to address the special problems of the rural displaced homemaker, or the unique concerns that rural programs themselves face. Such programs as the YWCA displaced homemaker program in Grand Island, Nebr., the Pierce County community action program for displaced homemakers in Tacoma, Wash., the CETA-based displaced homemaker program in New Ulm, Minn., and the Carbondale, Ill. Women's Center displaced homemaker program have all now been in existence for close to 2 years, and have experimented with program provision to rural target population.

A caucus of rural program providers met at the First National Training Conference on Displaced Homemakers held in Baltimore, Md. in October 1978 to discuss their models, the special needs of the population they serve, and the problems they encounter. They expressed concerns about the different funding needs of rural programs—the need for more extensive budgets to deal with higher transportation and phone costs and support services. They expressed concern for the lack of resources for training for rural displaced homemakers and the problems involved in doing job placement in rural areas, many of which suffer severe unemployment. They emphasized the need in rural areas to bring programs to where the women are, rather than to centralize services in one population area. They also pointed to the fact that rural homemakers tend to marry earlier than their urban counterparts and therefore may be displaced after 10 or more years of homemaking while still under 30 years of age.

The experiences of the ongoing rural programs have lead to some understanding of what makes a rural program work for its participants.

As a first priority, a rural displaced homemaker program must win the trust of the residents it serves, who are often distrustful of anything that might pose as a threat to their family's present life style. The displaced homemaker may feel that she does not measure up to her community's norm of self-sufficiency. She may share her community's suspicion of new programs.

Traditional publicity of the rural displaced homemaker program via newspaper, radio, and TV may not bring in displaced homemakers. Rapport should be developed with people in key local agencies and organizations in order to get the message of the program's existence and advantages to the women who are in need of it. A neighborhood advocate system, in which a person who has been helped by the program passes the message by word of mouth to others in her area, has been used by rural programs with great success. In rural areas there is no substitute for individual contact. Finding publicity contacts who are sympathetic to the cause is most helpful in spreading the word.

Problems of time, distance, and money (especially for gas) make group sessions for rural displaced homemakers a low priority. Sharing problems with strangers is a brand new, and often frightening experience for these women, whose lives have been spent guarding family

privacy. While group sessions are a prime component of urban programs, in rural areas other more individual forms of service are found more effective. A rural displaced homemaker program must be even more flexible than its urban counterpart meeting a wide variety of needs. One-to-one career counseling is frequently the most successful way of serving rural women. Out of necessity, support and one or two suggestions must be given "long-distance" by telephone. Because of distance problems, group sessions should be planned well in advance for an all-day period, rather than the more traditional plan of several workshops scheduled for a single week. Individual followup by phone is an important second step after any group process.

Chesapeake College, a regional community college located near Wye Mills, Md., has developed a variety of ways to assist displaced homemakers in the rural counties of the Eastern Shore of Maryland. Recognizing that community support was vital if a program was to be effective, the college hosted a regional meeting for the purpose of determining needs and expanding services to the area. Representatives from civic, social, and service organizations, as well as displaced homemakers themselves, attended. A task force resulted which recommended establishing a displaced homemaker reentry center to provide assistance with personal difficulties, social alienation, economic problems and training. Thus, community support was gained before the program was even developed.

The displaced homemaker reentry center then identified one individual in each existing service agency to act as a contact and resource person for the center. The contact and resource person has the responsibility of tracking the progress of each displaced homemaker referred to his/her agency by the center and of increasing the awareness of individuals within that agency of the center and the displaced homemaker it serves.

The college was already aware that it might pose a threat to undereducated or timid displaced homemakers initially. As it planned its program, therefore, it committed itself to delivering services in various locales in the five-county area, rather than concentrating its services only on campuses. County libraries, church halls, and other facilities were offered by early supporters as places to hold counseling sessions and some workshops. To get to these locales, a volunteer car pooling system is being developed.

To tackle the difficult job of developing employment prospects for their participants, the college proposed 25 employer visits during the first 5 months by displaced homemakers themselves. It was hoped that, through these contacts, employers would be afforded the chance to watch displaced homemakers operating in a professional capacity. Stereotypes and prejudicial attitudes, which might hinder their acceptance of displaced homemakers as employees, might thereby be eliminated. Also, the interaction establishes a linkage between the center and the employer for future job development. Three months after an employer visit, a followup visit by the same team is scheduled, in order to document any changes in employment practices related to the target population.

In another rural Maryland county, a program is dealing with the problem of transportation and job development in another way. It

plans to develop jobs through the displaced homemaker program to train individuals for positions in a projected countywide transportation system. Funds have been committed to create training and will be sought to develop the system itself—for example jobs. Displaced homemakers will be trained as auto mechanics, transportation planners, drivers, dispatchers, etc.

Nontraditional and job creation programs are important facets to be considered in rural displaced homemaker programs. With jobs hard to find and with high-demand occupations in rural areas largely male dominated, these programs provide options sorely needed in the rural environment. Moreover, the skills acquired by rural women working side by side with their husbands, or doing the agricultural tasks while their husbands commute to a city job translate effectively into nontraditional employment. Models for these and other rural programs are being developed now across the country. In the true sense of the word, pioneer program development is needed. It's challenging, engaging, and it's often an uphill battle.

CONCLUSIONS

Rural or urban, the displaced homemaker in any part of the United States today has an uphill battle. But the collective battle is being creatively and committedly fought in programs and by advocacy groups of displaced homemakers and others across the Nation.

We can take great pride in our achievements over the past 4 years. In that short time, 300 programs serving displaced homemakers have been established. Displaced homemaker legislation has been passed in 30 States. A Federal bill has added displaced homemakers as a priority group for CETA services. A national organization was formed to provide a network for all programs. Established training institutions have begun to create new services.

The displaced homemaker movement has always been a grassroots movement—initiated by displaced homemakers for displaced homemakers, with the assistance and support of other advocates, service professionals, and committed agency personnel. Our accomplishments are great; the strides we've made are commendable. It is our hope that those of you in attendance at this Food and Agricultural Outlook Conference will join us in ensuring that the battle we have started continues with added support.

SINGLE-PARENT FAMILIES

(By Beverly L. Johnson, Office of Current Employment Analysis, Bureau of Labor Statistics)

One of the striking changes in family structure since 1970 has been the increase in the number of one-parent families. In March 1979, nearly 1 of every 5 families with children under 18 was maintained by a single parent—who was either divorced, separated, widowed or never married—compared with 1 of 9 in 1970. The accelerated growth in the number of one-parent families during the seventies—an increase of over 2½ million between 1970 and 1979—was far greater than that registered during the preceding two decades, 1950–70 (table 1).¹ These 5.9 million single-parent families are of special concern because 2 out of every 5 have incomes below the poverty level, compared with 1 of every 16 two-parent families.²

One-parent families are largely maintained by mothers; the 10 percent that are maintained by fathers rarely face the economic difficulties encountered by families with a mother only. The proportion of families maintained by a mother only which were below the poverty level was nearly 3 times that of families maintained by a father only (42 and 15 percent respectively).

Many studies have been conducted which show that living in single-parent families often has enduring socioeconomic effects on children, such as tendencies toward future marital breakups, less formal education, and greater likelihood of juvenile delinquency.³ Lack of longitudinal data sets, inadequate models of child development and inadequate measures of the amount and quality of parent-child interactions restrict the conclusions which can be drawn from these studies.⁴ However, in spite of these problems, researchers in this area agree that the low income of single-parent families affects the eventual socioeconomic status of the children. This is particularly true of children in families maintained by the mother only who are far more likely than children in other types of families to live in poverty.

¹ The term single-parent refers to a person who is either never-married, widowed, divorced or separated and maintaining a family and residing with one or more own children under 18 years old who are related by blood, marriage or adoption. For more information, see Beverly L. Johnson, "Women Who Head Families: A Socioeconomic Analysis" Monthly Labor Review, February 1978, reprinted as Special Labor Force Report 213.

² Families are classified as being above or below the low income level according to the poverty index adopted by a Federal Interagency Committee in 1969. The poverty thresholds are updated every year to reflect changes in the Consumer Price Index. Thus, the poverty threshold for a nonfarm family of four headed by a woman was nearly \$6,162 in 1977, about 6 percent higher than the 1976 cutoff of almost \$5,800. For further details, see "Characteristics of the Population Below the Poverty Level: 1977," Current Population Reports, Consumer Income, series P-60, No. 119 (Bureau of the Census) 1979, p. 206.

³ See, for example, Beverly Duncan (1967) "Education and Social Background," pp. 363–72, American Journal of Sociology, 1967. Brandwein, Ruth—"Divorced Mothers and Their Families," Journal of Marriage and Family, 1974 or Sandra Stencel, "Single-Parent Families" Editorial Research Reports, vol. 11, Sept. 10, 1976, pp. 666–669.

⁴ See Heather Ross and Isabel V. Sawhill, "Time of Transition: The Growth of Families Headed by Women" (Washington, the Urban Institute, 1975).

As already indicated, the dramatic rise in the number of one-parent families during the seventies occurred mainly among families maintained by women. The most prominent reason for this was the rising incidence of marital breakup.⁵ Since 1970, the divorce rate in this country has grown from 3.5 per 1,000 population to 5.2 per thousand.⁶ (From 1950 to 1970, the rate of divorce only rose from 2.6 to 3.5 per thousand.) Another factor, but of less importance, has been the rising proportion of births outside of marriage. By 1975, 14 percent of all babies were born to unmarried women, as compared with 4 percent in 1950. In part this reflected child bearing among teenagers. In 1950, women under 20 bore 12 percent of all children but by 1975, the proportion was 19 percent.⁷

There is no specific evidence that these young mothers, whether married or never married, will eventually maintain their own family households. Yet, a recent study exploring the association between having a first birth as a teenager and later maintaining a family, found that early childbearing, whether of a teenage marriage or of a premarital birth is a good predictor of a woman later becoming "the head of her family."⁸

Single parenthood has been defined as "a time between living in one nuclear family and another,"⁹ but increasing numbers of children are born to single parents and may well remain in single-parent families throughout their childhood and adolescence. Children in one-parent families are not all products of broken homes; some may never have had the opportunity to be part of a two-parent family.

LABOR FORCE

Accompanying the large increases in the numbers of mothers heading their own families have been large gains in the numbers who are working. In March 1979, the labor force participation rate of mothers maintaining families was 65.9 percent, up from 59.4 percent in March 1970 (table 2).

Although mothers maintaining their own families were far more likely to be in the labor force than those in two-parent families—66 versus 50 percent—unemployment was far more prevalent among single-parent mothers. At 10.5 percent, the unemployment rate for mothers maintaining their own families was much greater than that of married mothers—6.2 percent.

As might be expected, the labor force rates of mothers maintaining families vary by the age of the youngest child. About 56 percent of the mothers in single-parent families with children under 6 years were working or looking for work compared with about 72 percent of those with children 6 to 17 years.

⁵ See SLFR No. 190 and No. 213 for detailed discussion on divorce, etc. Also see Allyson Sherman Grossman, "Divorced and Separated Women in the Labor Force—An Update," *Monthly Labor Review*, October 1978, pp. 43–45.

⁶ See *Monthly Vital Statistics*, vol. 23, No. 11, PHS—75-1120, and vol. 27, No. 13, PHS—79-1120 (Rockville, Md. Department of Health, Education, and Welfare).

⁷ See Kristin A. Moore, Sandra L. Hofferth, Steven B. Caldwell, Linda J. Walte, "Teenage Motherhood, Social and Economic Consequence, an Urban Institute Paper on Women and Family Policy, the Urban Institute, January 1979. Also see *Monthly Vital Statistics Report*, vol. 26, PHS-79-1120 No. 5.

⁸ Urban Institute Report, p. 27.

⁹ Ross and Sawhill, op. cit.

CHILDREN IN SINGLE-PARENT FAMILIES

Accompanying the rise in the number of single-parent families has been an extraordinary increase in the total number of children in these families. In March 1979, about 10.8 million children were living in single-parent families—a gain of over 3 million since 1970 (table 3).

Children in single-parent families are more likely to have working mothers than those in two-parent families. In March 1979, about 6 of 10 children living with their mother only had mothers in the labor force, compared with 5 of 10 of those living with both parents. Unlike the pattern in two-parent families, white children in single-parent families were far more likely to have working mothers than were the black children—67 and 53 percent respectively in 1979. In contrast, in two-parent families only 49 percent of the white children had working mothers, compared with 61 percent of the black.

EDUCATION

A surprisingly high proportion of mothers who maintain families have not completed high school and relatively few have completed college. For example, in March 1978, 38 percent of these mothers had less than a high school education but just 4 percent had 4 years of college or more. Mothers in two-parent families tend to be far better educated; only 24 percent of married mothers had less than a high school education while 12 percent were college graduates. This difference in educational attainment is because a larger proportion of mothers maintaining families are blacks or Hispanic who have completed, on average, fewer years of school than whites.

FAMILY INCOME

Women whose marriages end by divorce, separation, or death often experience substantial declines in their family income. In 1978, median income for single-parent families (\$7,800) averaged only about 38 percent that of two-parent families, largely because families maintained by mothers had extremely low income. The average income of families maintained by the mother was only 34 percent that of two-parent families while the median income for single-parent families maintained by the father was about 71 percent that of two-parent families.

Several factors contributed to the income differences. Families maintained by mothers were less likely than the other families with children to have more than one earner; in 1977, for instance, just 19 percent of these families had two or more earners, compared with 28 percent of the single-parent families maintained by fathers and 64 percent of the two-parent families. Furthermore families maintained by the mother are more likely than other families to have preschool children in the home, and as is well known, the presence of young children restricts the labor force activity of their mothers. Also, as noted earlier, a very high proportion of mothers in single-parent families had not completed high school—4 out of 10 in 1978—and low educational levels are usually associated with low labor force participation, high unemployment, and low pay.

Even when the mother was in the labor force, single-parent family income was likely to be considerably lower than that of either two-parent families or families maintained by fathers. Average income in 1978 of single-parent families with working mothers (\$8,900) was 54 percent that of comparable families with fathers in the labor force (\$16,500) and only 40 percent that of two-parent families with working mothers (\$22,200).

Not surprisingly, in view of their lower average income, an exceedingly high proportion of these families maintained by a mother had incomes below the poverty level,¹⁰ as shown below:

POVERTY RATE FOR FAMILIES WITH CHILDREN UNDER 18 YR, BY RACE AND HISPANIC ORIGIN, 1977

	Total	White	Black	Hispanic ¹
2-parent families.....	6.3	5.5	14.1	14.8
Single-parent families:				
Father only.....	14.8	11.3	21.4	NA
Mother only.....	41.8	33.8	57.6	60.3

¹ Hispanic origin may be of either race.

Many of the poor single-parent families maintained by a mother relied on public assistance to help support the daily needs of their members (table 4).

AFDC mothers.—Aid to Families with Dependent Children is one of the major sources of income for mothers with no husbands. Of some 3.2 million mothers receiving AFDC assistance in 1977, well over 80 percent of them had no husband present in the home.¹¹ Most AFDC mothers do not work for a variety of reasons; out of every 100 AFDC mothers, 41 were full-time homemakers, 7 were incapacitated for employment, 3 were receiving schooling or training, and 24 were not actively seeking work. Of the remaining 25 who were in the labor force 11 were unemployed, and only 14 were employed.

The predominant occupations of the AFDC mothers who reported their employment were service and clerical jobs. Only a small proportion were in professional and managerial jobs, a situation largely attributable to the fact that a high proportion of AFDC mothers were not even high school graduates. In 1977, 60 percent of the AFDC mothers reporting their levels of education had not completed high school.

RACE AND HISPANIC ORIGIN

Thus far, we have taken a rather detailed look at single-parent families, particularly those maintained by women. However, any examination of single-parent families would be incomplete if it did not take a look at some of the considerable differences in labor force participation and income between white, black, and Hispanic families. In March 1979, nearly half of all black families with children, compared with one-fourth of all Hispanic, and one-sixth of all white families were maintained by a single parent. Black families represented a disproportionate share of the total single-parent families in

¹⁰ "Characteristics of the Population Below the Poverty Level: 1977," series P-60, No. 119, nn. 83-86.

¹¹ See HEW Publication No. (SSA) 77-11777, Aid to Families With Dependent Children, 1975, Recipient Characteristics Study, part I, Demographic and Program Statistics, by Howard D. Oberhu.

this country—30 of every 100 single-parent families were black, compared with only 8 of every 100 two-parent families. Black and Hispanic single-parent families have lower average income than their white counterparts and are far more likely to be living below the poverty level. In addition, the single parent in black or Hispanic families was less likely to be in the labor force and more likely to be unemployed than the white single parent maintaining a family.

Marital status, age, family size, and education are among the major factors underlying differences in labor force participation among these racial and ethnic groups. White mothers were more likely to be divorced (50 percent, compared with 24 and 30 percent, respectively for black and Hispanic mothers), and divorced women have higher labor force participation rates than other women. Moreover, black and Hispanic mothers tend to be younger than white mothers maintaining families, and their children also tend to be younger and require more care. In addition, black and Hispanic mothers who were single parents had more children per family than the white mothers; in 1978, black mothers had 2.2 children per family, compared with 2 for Hispanic and 1.8 for white mothers maintaining families. Finally, Hispanic mothers in these families tend to have considerably fewer years of schooling than whites or blacks; and, of course, education and labor force participation are closely tied together. In March 1978, three out of seven Hispanic mothers maintaining families had 8 years or less schooling, compared with about one out of seven of the black and white mothers.

Unemployment was lower among white mothers maintaining families than among black or Hispanic, and, for much the same reason that the white mothers' labor force participation was higher. In March 1978, the unemployment rate for white mothers was about 7.8 percent, compared with 18.8 percent for black and 10.2 percent for Hispanic mothers.

As might be expected in view of the differences in labor force and unemployment rates, white single-parent families maintained by a mother had higher incomes than either black or Hispanic families. Nevertheless, whether white, black, or Hispanic, the median income of families maintained by a mother was drastically below that of either single-parent families maintained by a father or two-parent families. Even when the mothers were in the labor force, the differences were acute, no matter what the race or ethnic origin of the mother. Taking whites, for example, the 1977 median income of families maintained by the working mother (\$9,800) was only 54 percent that of single-parent families with the father in the labor force and only 44 percent that of two-parent families where the mother worked or looked for work. Although the percentages and income levels were different among blacks and Hispanics, the same pattern held true—income of single-parent families maintained by mothers was considerably less than the income of either two-parent families or families where only the father was present.

CONCLUSION

The socioeconomic picture of single parent families that these statistics show us is not a very pleasant one. Perhaps the most outstanding characteristic of these families is low income and poverty; average

income of single parent families maintained by mothers was only one-third the income of two-parent families, and many of these single-parent families were living in poverty.

These data are especially distressing from the point of view of the children in single-parent families. These children will grow to maturity in economically poor conditions, experiencing the insecurity, both physical and psychological, that can result from economic deprivation. It cannot be doubted that such an environment will have life-long effects. As the number of children in single-parent families continues to grow—reflecting the uptrend in marital breakup—the problem will grow in magnitude.

Unfortunately, support systems for single-parent families are fragmented. There is no national policy concerning the provision of child care; parents are still responsible for providing for the care of their preschool children and for their schoolage children before and after school. The fact that there is no national policy in this regard makes the problem of finding and paying for adequate care difficult for many mothers.

With regard to economic support, single-parent families often derive part of their income from State and local welfare programs and AFDC. However, it is clear from the income data cited above that these sources do not provide levels of income similar to two-parent families. Certainly, new policy initiatives in the areas of child care, income maintenance, and education could go a long way toward alleviating some of the hardships encountered by single-parent families.

[This speech is based on the Special Labor Force Report "Working Mothers in the 1970's: A Look at the Statistics," which was published in the October 1979 Monthly Labor Review.]

TABLE 1.—FAMILIES WITH OWN CHILDREN UNDER 18 YR OLD, BY TYPE, SELECTED YEARS, 1950-79

[Numbers in thousands]

Year	All families with own children ¹	Married couple families ²	Single parent families ³			
			Total	Single parent families as percent of all families with children	Maintained by men ³	Maintained by women
1950.....	19,847	18,316	1,531	7.7	275	1,256
1960.....	25,662	23,333	2,329	9.1	232	2,097
1970.....	28,669	35,412	3,257	11.4	333	2,924
1971.....	28,796	35,096	3,700	12.8	332	3,368
1972.....	29,461	25,492	3,969	13.5	368	3,601
1973.....	29,575	25,396	4,180	14.1	385	3,795
1974.....	29,763	25,289	4,474	15.0	394	4,080
1975.....	30,060	25,236	4,824	16.0	424	4,400
1976.....	30,177	25,110	5,067	16.8	446	4,621
1977.....	30,145	24,875	5,270	17.5	486	4,784
1978.....	30,369	24,625	5,745	18.9	539	5,206
1979.....	30,371	24,514	5,857	19.3	569	5,288

¹ Children are defined as "own" children of single-parent families. Included are never married sons, daughters, step children, and adopted children. Excluded are other related children such as grandchildren, nieces, nephews, cousins and unrelated children.

² Includes divorced, separated, widowed or never-married parents.

³ Includes men in Armed Forces living off post or with their families on post.

TABLE 2.—LABOR FORCE STATUS OF SINGLE PARENTS, BY SEX, AND AGE OF OWN CHILDREN UNDER 18 YR OLD, MARCH 1970 AND 1979

(Numbers in thousands)

Labor force status	March 1970			March 1979			Median income of families with own children under 18 yr in 1978 ¹
	With own children under 18 yr total ¹	Children 6 to 17 yr	Children under 6 yr	With own children under 18 yr total ¹	Children 6 to 17 yr	Children under 6 yr	
Total single-parent families.....	3,257	2,075	1,182	5,857	3,797	2,060	\$7,596
Families maintained by women.....	2,924	1,813	1,111	5,288	3,362	1,926	7,035
Mother in civilian labor force.....	1,736	1,215	521	3,486	2,406	1,080	8,945
Labor force participation rate.....	59.4	67.0	46.9	65.9	71.6	56.1	-----
Employed.....	1,611	1,143	468	3,119	2,206	913	9,513
Unemployed.....	125	72	53	367	199	168	4,312
Unemployment rate.....	7.2	5.9	10.2	10.5	8.3	15.6	-----
Mother not in labor force.....	1,188	598	590	1,802	957	845	4,151
Families maintained by men ²	333	262	71	569	435	134	14,589
Father in civilian labor force.....	304	237	67	496	375	121	16,481
Labor force participation rate.....	91.3	90.5	(³)	87.2	86.2	90.3	-----
Employed.....	297	230	67	469	365	104	17,146
Unemployed.....	7	7	-----	27	10	17	(⁴)
Unemployment rate.....	2.3	3.0	-----	5.4	2.7	14.0	-----
Father in Armed Forces.....	(⁴)	(⁴)	(⁴)	10	4	6	(⁴)
Father not in the labor force.....	29	25	4	64	56	7	(⁴)

¹ Children are defined as "own" children of single-parent families. Included are never married sons, daughters, step children, and adopted children. Excluded are other related children such as grandchildren, nieces, nephews, cousins, and unrelated children.

² Includes divorced, separated, widowed or never-married parents.

³ Rate or median not shown where base is less than 75,000.

⁴ Not available.

TABLE 3.—NUMBER OF OWN CHILDREN UNDER 18 YR OLD IN SINGLE PARENT FAMILIES BY AGE, AND LABOR FORCE STATUS OF MOTHER MARCH 1970 AND MARCH 1979

Item	Total children under 18		Children 6 to 17		Children under 6	
	1970	1979	1970	1979	1970	1979
Total children ¹ under 18 yr.....	65,755	58,537	46,149	41,556	19,606	16,981
Total children in single parent families ²	7,356	10,751	5,670	8,210	1,686	2,541
Families maintained by women.....	6,695	9,822	5,102	7,442	1,593	2,380
Mother in labor force.....	3,562	6,043	2,919	4,779	643	1,264
Mother not in labor force.....	3,133	3,779	2,183	2,663	950	1,116
Families maintained by men.....	661	929	568	768	93	161
WHITE						
Total children ¹ under 18 yr.....	56,903	49,436	39,963	35,039	16,940	14,397
Total children in single parent families ²	4,567	6,722	3,674	5,233	965	1,490
Families maintained by women.....	4,102	6,005	3,194	4,626	908	1,379
Mother in labor force.....	2,329	4,015	1,953	3,206	376	809
Mother not in labor force.....	1,773	1,990	1,241	1,420	532	570
Families maintained by men.....	465	717	480	607	57	111
BLACK						
Total children ¹ under 18 yr.....	8,054	7,800	5,673	5,661	2,381	2,139
Total children in single parent families ²	2,719	3,831	2,021	2,840	698	992
Families maintained by women.....	2,529	3,647	1,866	2,702	663	946
Mother in labor force.....	1,205	1,945	949	1,514	256	431
Mother not in labor force.....	1,324	1,703	917	1,188	407	515
Families maintained by men.....	190	184	155	138	35	46

¹ Children are defined as "own" children of single-parent families. Included are never married sons, daughters, step children, and adopted children. Excluded are other related children such as grandchildren, nieces, nephews, cousins, and unrelated children.

² Includes divorced, separated, widowed or never-married parents.

TABLE 4.—SELECTED CHARACTERISTICS OF FAMILIES WITH FEMALE HEAD, BY POVERTY STATUS IN 1977, BY RACE AND HISPANIC ORIGIN OF HEAD

[Numbers in thousands]

Selected characteristics	Total		White		Black		Hispanic origin ¹	
	Number	Percent below poverty level	Number	Percent below poverty level	Number	Percent below poverty level	Number	Percent below poverty level
Families with female head ²	8, 236	31.7	5, 828	24.0	2, 277	51.0	561	53.6
Size of family:								
2 persons	3, 807	22.7	2, 958	18.3	783	38.9	198	45.9
3 persons	2, 175	29.4	1, 608	23.7	533	46.1	150	46.4
4 persons	1, 162	42.0	737	33.9	400	56.5	104	63.9
5 persons	610	52.1	331	29.1	269	67.1	56	(³)
6 persons	261	57.8	124	48.2	132	67.2	34	(³)
7 persons or more	231	66.9	70	(³)	160	72.7	19	(³)
Number of related children under 18 yr:								
No children	2, 527	8.9	2, 094	6.6	399	20.4	88	17.7
1 child	2, 459	30.6	1, 759	25.9	651	43.6	190	47.0
2 children	1, 728	39.2	1, 200	32.5	501	54.5	127	56.1
3 children	837	54.1	473	47.0	354	63.1	82	72.2
4 children	421	69.1	214	59.4	201	78.7	51	(³)
5 children or more	263	79.7	88	74.4	171	82.8	24	(³)
Work experience of head in 1977:								
Worked last year	4, 970	18.8	3, 630	13.9	1, 250	32.8	241	29.9
Worked 50 to 52 weeks	3, 073	6.6	2, 293	3.6	728	16.2	122	5.2
Full time	2, 728	4.7	2, 044	2.7	631	11.3	109	3.4
Worked 1 to 49 weeks	1, 895	38.7	1, 337	31.6	523	55.8	119	55.2
Reason for working part year:								
Looking for work	621	32.5	409	20.3	200	56.2	45	(³)
All other reasons	1, 274	41.7	928	36.5	323	55.6	74	(³)
Did not work last year	3, 266	51.2	2, 199	40.7	1, 027	73.2	321	71.5
Occupation of longest job of head:								
Professional and managerial workers	915	6.6	744	5.8	148	10.8	29	(³)
Clerical and sales workers	1, 815	12.4	1, 438	9.6	347	23.5	92	(³)
Craft and kindred workers	122	28.0	91	17.3	30	(³)	6	(³)
Operatives, including transport workers	757	21.2	515	14.2	226	35.3	80	29.3
Service workers, including private household	1, 248	33.0	769	27.2	461	42.4	58	(³)
Laborers, except farm	65	(³)	36	(³)	29	(³)	5	(³)
Farmers and farm laborers	46	(³)	35	(³)	10	(³)	9	(³)

¹ Persons of Hispanic origin may be of white, black, or other races.² Families as of March 1978.³ Number not shown when base is less than 75,000.

Source: Money Income and Poverty Status of Families and Persons in the United States: 1977, Current Population reports, series P-60, No. 116 (Washington: U.S. Department of Commerce, Bureau of the Census, 1978), table 20, p. 27.

RETIREMENT INCOME IN AN INFLATION ERA

(By James Hacking, assistant legal counsel, American Association of Retired Persons—National Retired Teachers Association)

Between 1970 and early 1979, the overall consumer price index rose at an average 7.1 percent yearly rate. Currently the rate is in excess of 13 percent. As harmful as inflation is to the purchasing power of the general public, it is far worse for the elderly. Price increases for necessities have been far more rapid than those for other goods and services. The elderly, who spend much more of their limited family budgets on necessities than the nonelderly, are in an increasing untenable situation. And the inflationary trend is building—not declining.

It is clear that inflation is the No. 1 problem that the elderly face today. In fact, the NRTA and AARP consider inflation to be such a serious concern that a contract was entered into with Data Resources, Inc., to study the effect that inflation has had on the elderly in terms of their income, assets, and expenditure patterns. Inflation's effect on the elderly is an area that is apparently not well understood. Indeed there is a "new economic wisdom" which appears to be gaining adherents that holds that the elderly fare very well in inflation times due to the implementing, expansion, and indexing of Government programs like SSI and social security. The associations are certain this "new wisdom" is wrong and intend to prove it wrong.

In order to decide how retirement income should be provided and how the current elderly generation is faring, a judgment must be made as to what constitutes an adequate income in old age. In the associations' view, adequate income should be defined as "that level of income required by an older person to maintain in his or her later years a standard of living at least equal to the highest standard achieved in his or her earlier years." A person's standard of living in his or her later years should not deteriorate if that person made reasonable arrangements for the preservation of that living standard.

A person has a variety of options when planning for retirement. The associations consider social security to be the base for retirement planning. But to that base other programs and options should contribute other income increments so that that individual can meet the "adequacy" goal. Inflation has caused complications in this planning process because it has created great areas of uncertainty about the expected contributions of the income components outside of social security and has begun to undermine the financial viability of the social security program itself.

Federal income transfer programs, such as social security and supplemental security income are indexed, so that benefits rise according to increases in the CPI. However, while progress has been made in

putting cost-of-living escalator into these programs, much of the rest of the retirement income model has been shattered by inflation.

Most non-Federal Government components of retirement income are largely unprotected from the effects of inflation. Private pensions, as well as those of State and local retirees, fail to provide benefits that reflect increases in living expenses. Many of these plans do not even attempt to readjust benefits for retirees. Also, small savers, many of whom are retirees, are continually losing to inflation because of regulation Q, which artificially limits the small saver to interest rates which are currently less than half the rate of inflation. On the whole, the elderly are not very good at protecting their assets, especially their dollar-dominated assets, against inflation.

The older the retiree and the more remote he is from the retirement date, the greater has been the dissipation of the assets on which he expected to rely for supplementing income during retirement. Although other factors are involved, such as lower initial incomes of older cohorts, it is not surprising to note that those age 72 and over constitute the poorest of the elderly age groups. The older retiree's plight reflects a trend that is increasingly being felt by all retirees whose retirement plans are being upset by inflation. As their assets dwindle in value, the only major source for consistent retirement income has been the Federal Government's cost-indexed programs.

Increasing reliance on Government programs is a frightening trend for a number of reasons. First, social security benefits alone will be unable to meet the adequacy goal. Also, increased reliance on social security will impose serious financial strains on the system, particularly in light of economic and demographic trends, which place still further strains on Government programs.

Benefits derived from Government programs, which constitute the base of retirement income, have helped to diminish poverty rates for the elderly. However, at the same time, the inflation trend has been dissipating many other sources of a retiree's income. The result is that the elderly are increasingly concentrated in the lower reaches of the income distribution.

While the inflationary trend continues—and there are virtually no signs that this trend will be ending in the foreseeable future—several things ought to be done to help older Americans better maintain their real retirement income levels.

One source of income whose growth tends to keep pace overtime with the rate of inflation is wage income. Ready access to employment, and therefore wage income could be the best inflation hedge for the elderly. In addition, an increase in older workers has such beneficial results as greater tax revenue, decreased elderly dependency on Government programs and younger taxpayers, and more economically productive older people.

The associations have developed an outline for a national older worker strategy. The first element in this strategy is the elimination of existing employment barriers, particularly mandatory retirement policies. Paralleling the need to eliminate existing barriers to employment is the equally acute need to eliminate existing work disincentives. The major element in this category is the earnings test of social security. The associations are persuaded that the earnings test is already costing society as a whole more than it would cost the social security program to eliminate it. Elimination of the earnings test will enable pro-

ductive people to remain active in the work force, and obtain relatively inflation-proof wage income.

The third element of the associations' older worker strategy is the introduction of work incentives. One such incentive for example would be the introduction of actuarially increased social security benefits for persons who elect to delay their retirement until after the age of 65. The Government might also provide for tax incentives for the employment training and retraining of older workers, and for the expansion of programs emphasizing on-the-job training of older workers.

Retirement policy in an inflationary era will be further benefited if a saving option is made viable. Specifically, the savings disincentive which is directly attributable to the artificially low rates on savings dictated by regulation Q must be dealt with. Under regulation Q, small savings accounts return less than one-half the current rate of inflation. Regulation Q ought to be eliminated; interest rates ought to be set by the marketplace.

Savings should also be encouraged through the tax code. The associations are supporting proposals which exempt a small portion of interest income on savings accounts from Federal taxation. They also suggest that an employee be allowed a deduction for funds he or she contributes to a qualified pension plan in which he or she participates, provided these contributions are used to provide some inflation protection with respect to their benefits from the point of retirement on. At this point there is no feasible and realistic legislative scheme to require employers to finance cost-of-living adjustments in private pensions that would not risk wholesale pension plan terminations.

Through the adoption of proposals such as these the effect inflation is having on retirees can be reduced. However, one must not lose sight of the problem amidst the various inflation-compensation proposals. The real problem is inflation. It is destroying the income, assets, and standards of living of the elderly and causing present workers to wonder whether there is any use to plan for retirement or even if there is any reason to save for the very next day. Inflation must be brought under control.

Because the health of the economy ought to be the chief concern, pension policy proposals—to be good—must be good economic policy as well. The proposals advanced here are designed with that idea in mind. For example, encouraging access for the older person to wage income will provide that person with a relatively inflation-proof income source. But at the same time this policy will yield tax revenue, enhance the Nation's gross national product, lessen that person's dependency on Government programs such as social security and SSI, and lessen the dependency burden that younger worker/taxpayers must bear. Another example is in the establishment of incentives for savers through tax policy and the allowance of competitive interest rates by the elimination of artificial regulatory ceilings. While such a policy would prompt people to save for their retirement, it would also provide needed capital to the economy. It would, thus, support productivity gains and thereby lessen inflation.

Of course, there are factors which are contributing to the present rate of inflation and with respect to which pension policymakers obviously have no control, such as the price of energy. However, in many ways, sound pension policy can make good economic sense. A population that is given reason to plan for its retirement can help create a more productive and inflation-free economy.

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OUTLOOK FOR HOUSING

(By Dr. Peter Treadway, Vice President and Chief Economist, Federal National Mortgage Association)

The current outlook for housing is basically a function of five inter-related variables: 1) financial market conditions, particularly mortgage market conditions, 2) the prospects for inflation, 3) the general economic outlook, 4) the cost of housing as compared with consumer income and 5) the expected demographic demand for housing. In this discussion, I will treat each of these topics and then conclude with a summary of my views on housing in 1980.

FINANCIAL MARKET CONDITIONS AND OUTLOOK

The current financial environment has turned decidedly unfavorable for housing. Although both long and short term interest rates have been rising since 1977, the real "squeeze" on housing finance began to be noticeable only in 1979. Through September, housing starts have averaged 1.758 million units (at annual rates), a strong level but 11.4 percent below 1978.

Financial conditions generally impact housing in two ways, namely, through yield and through availability. As the accompanying table shows, yields on mortgages have been climbing steadily upward. However, I believe that it is an error to place much emphasis on the absolute level of mortgage yields. In the last year, yields on new mortgages have broken through the 10 and 11 percent barriers without any housing collapse. In fact with house prices rising approximately 13 percent per year and with mortgage interest tax deductible, a 10 or 11 percent mortgage has been a real bargain. With mortgage yields just reaching the 13 to 14 percent area on new commitments, mortgage interest rates are just reaching a level where they involve a real—pretax—cost on terms of the overall rate of inflation. It seems safe to say that through September anyway rising mortgage rates have had a relatively modest impact on housing activity.

The credit availability problem in the past is what has placed a large role in bringing housing to a halt. In 1969–70 and 1973–74, savers found money market rates more attractive than those on savings deposits and diverted funds out of savings and loans and mutual savings banks (which are mainstays of the primary mortgage market) and placed funds in short term money instruments such as Treasury bills. The process was called disintermediation. The result was that for a while housing was credit starved—mortgages in many areas were not available at any yield—and housing stalled.

To some extent that has occurred on a lesser scale in 1979. Despite the institution of money-market certificates (MMC's) which allowed thrift institutions to offer a 6-month certificate at rates almost com-

petitive with money market yields, savings flows have been inadequate in 1979 (see table 1) and this factor more than anything else probably explains why housing is off 11.4 percent.

The immediate outlook for housing finance is not so good. Since the Federal Reserve's tightening of October 6—the so-called Saturday afternoon massacre—interest rates have moved sharply upward across the board. There is still a significant chance that rates have further to go upward before the end of the year. In the next 2 months, I would expect that savings flows will be very inadequate, if not negative, and potential borrowers will have to contend with both higher mortgage rates and credit availability problems in the immediate future. Interest rates, including mortgage rates will likely be falling in the first half of 1979. But don't hold your breath for the so-called good old days (of the 9-percent mortgage?) to return soon. Over the next 18 months we will be fortunate if mortgage rates drop even to 11 percent for a 20-percent down conventional mortgage. Once the crunch that we're now in eases, mortgage money will be available but at yields that on a historical basis are quite high.

THE PROSPECTS FOR INFLATION

Owning a house or a condominium has been a good investment in an inflationary economy because a) these are real goods which tend to appreciate with inflation b) they are easy to leverage and interest rates have typically been below inflation levels in recent years and c) mortgage interest rates are tax deductible. The outlook for housing then cannot be divorced from inflation prospects because homebuyers now take inflation into account in their homebuying plans.

In my opinion, the outlook is for inflation to continue somewhere in the 8- to 10-percent range where it is at present. I am not optimistic about any significant lowerings over the next few years. The following observations head to this pessimism:

(1) The current inflation rate took 15 years of monetary and fiscal excesses to create and it is not going to be eliminated in 1 or 2 years. Moreover, most sectors of society—wage earners, homebuyers, lenders, and even the Government—have adjusted to the expectation of more inflation. This fact of adjustment makes any abrupt downward change in inflation all the more unlikely because it will be so painful. The homeowner who borrowed at 12 percent—whether he realizes it or not—has a vested interest in having his house appreciate in value at a 10- to 15-percent rate.

(2) The "old time medicine" of a big recession to cure inflation has been discredited politically. The U.S. suffered the worst recession in 1974-76 since the Great Depression and it ultimately was a failure—the underlying rate of inflation in 1979 is almost double that of 1974.

(3) Next year is an election year and traditionally bad times and rising unemployment are the wrong background for an incumbent seeking reelection. There are limits as to how far or how long the Fed can go with its current tightening policy. It should be noted however, that the recent Fed moves have probably spared the economy further ratcheting up of inflation in the immediate future.

(4) There are several supply side factors which will probably push inflation upward regardless of monetary or fiscal policy. Three deserve mention here:

(a) Energy—Oil prices give every indication of rising faster than the inflation rate over the next few years.

(b) Farm prices—Rising energy prices, possible water conflicts with energy programs in the West and rising world population suggest real wholesale prices of wheat, corn, and red meat will not decline in the next few years as they did from 1950–70.

(c) Environmental and safety regulations—Despite the current backlash in some quarters, these are not going to go away and they do add to conventionally measured costs and reduce productivity.

THE OUTLOOK FOR GNP IN 1980

I will give only a brief sketch here but in a nutshell we don't see a Great Depression in 1980. Our view is that real GNP growth will be negative, say at 2.5 percent (annual rate) over this quarter and next and that growth will gradually turn positive from there on. This would result in real growth rates of 1.9 percent and -0.5 percent for 1979 and 1980 respectively. Inflation as measured by the GNP deflator (which is a better index than the CPI) should run at 8.9 percent and 9.2 percent for 1979 and 1980 respectively. Thanks to the 1979–80 recession, the rate of inflation will be down slightly in 1981.

THE COST OF HOUSING IN RELATION TO INCOME

Over the last 9 years, house prices have consistently outpaced consumer incomes. Up until recently at least, it seemed to some as though this situation could go on indefinitely. However, it is my view that the relative rise will increasingly be influencing the type of new housing that gets built. Table 2 presents the movement in median family income relative to the median house price. As can be seen housing is getting more expensive. Based on our estimate for 1979 this trend has intensified this year.

This increase in housing's relative cost has opened important implications for the future which will be discussed in the concluding comments.

THE DEMOGRAPHIC FACTORS SUPPORT A STRONG HOUSING DEMAND

One factor which will work to keep housing activity relatively strong over the next few years is the strong underlying demographic support for housing. These factors may be listed as follows:

First, the population of the United States is currently growing by at least 1.6 million persons per year. This alone adds to the potential need for additional housing.

Second, a large demographic "bump" is making its influence felt on American buying patterns. This bump consists of the children of the postwar "baby boom" who have been reaching household formation and housebuying age.

The statistics on this baby boom phenomenon make interesting reading. For example, the peak birth year for the United States was

1957 when 4.33 million births were recorded. Annual births began rising sharply at the end of World War II and from 1954 to 1964 births in the United States each year exceeded 4 million. Substantial declines in the number of births only began in the mid-1960's and, as a point of comparison, total U.S. births were 3.1 million in 1976. As the first "wave" of the baby boom reached adulthood from 1970 to 1977, the age 25- to 34-year-age group experienced a 31.8 percent growth—the highest percentage increase of any age group, as recorded by the Bureau of the Census.

As can be seen from table 3 the 25- to 34-year-age group is one in which dramatic increases in headship rates are normally recorded. The headship rate is derived from the number of households in a given population divided by that population and can be regarded as the propensity to form households. This rapid increase in a segment of the population, which coincidentally also has a high tendency to set up new households, can be expected over at least the next 5 years and probably into the late 1980's.

These facts have important implications for housing. For example a recent study by the United States League of Savings Associations estimated that 63 percent of first time homebuyers and 36 percent of all homebuyers were under the age of 30. Thus a good part of the baby boom will be household formation and housebuying age over the years 1979-83.

A third factor affecting housing demand is the increased percentage of women in the labor force. This has permitted the creation of more households in the case of divorced and single women, and has also broadened many families' ability to afford new and better housing.

A fourth demographic factor is the continuous rapid growth in the age 65 and over population. Increased prosperity has permitted a greater proportion of this rapidly growing group to maintain separate households. The headship rate of this group is likely to continue to be the highest of all age groups.

OUTLOOK FOR HOUSING IN 1980

A moderate recession, continuing inflation, lower but still historically high levels of interest rates, rising real energy costs and strong underlying demographic demand—these are the key ingredients for the 1980 housing picture. In terms of new housing activity, I am a relative optimist. Housing starts for 1980 could hit 1.6 million units thanks basically to the demographic demand and a continued view of housing as a good hedge against inflation. Existing home sales may come in at about 3.5 million units. In the first two quarters, however, new starts could average only 1.4 million units with a rise in housing activity in the second half of the year.

The type of house built may show some change from the past. The higher cost of houses (relative to income) as well as higher energy costs may work to half the trend to more square feet so evident in new house construction in recent years. What we may see is more attached housing, more condominium-type construction. In the 1.6 million unit forecast, I am assuming that 600,000 will be for multifamily (2 or more) units. About 150,000 to 200,000 units will be subsidized rental units and the majority of the rest will be oriented to condominium ownership rather than rental. Also mobile shipments may surprise some people and could run in the 300,000-unit area.

One fortunate aspect of the current situation is that unlike 1974 we do not have any major overbuilding at the present time. Housing inventories are modest—the 1979–80 recession has been forecast for 2 years—and vacancy rates are low. These factors mitigate against a housing bust in 1980 on the scale of 1974.

The big question is what happens after the next two quarters of less than 1.5 million start housing activity. In the next 6 months the rate of house price increases should slow down and some markets may show an actual downturn in house prices. But with the demographics as strong as they are, there is a real possibility that house prices may take off again in 6 to 9 months when money becomes available. The moderate curtailment in housing activity over the next 6 months can only eventually aggravate the problem.

TABLE 1.—MORTGAGE INTEREST RATES AND SAVINGS FLOWS

	Savings flows ¹ (millions of dollars)		Conventional mortgage rate ²
	S. & L.'s	MSB's	
1978:			
January.....	2,877	(59)	9.15
February.....	2,073	170	9.18
March.....	2,592	338	9.26
April.....	401	(553)	9.30
May.....	2,145	97	9.37
June.....	1,744	(90)	9.46
July.....	2,812	38	9.57
August.....	2,069	(75)	9.70
September.....	1,606	(41)	9.73
October.....	2,534	48	9.83
November.....	1,897	(59)	9.87
December.....	710	(405)	10.02
1979:			
January.....	4,377	(118)	10.18
February.....	2,580	342	10.20
March.....	3,146	463	10.30
April.....	(1,490)	(1,192)	10.36
May.....	1,627	(341)	10.47
June.....	1,469	(649)	10.66
July.....	1,459	(714)	10.78
August.....	717	(504)	11.01
September.....	(300)	(1,000)	11.02

¹ New deposits net of withdrawals and interest credited.

² FHLBB effective conventional mortgage rate for new homes.

TABLE 2.—FAMILY INCOME AND HOUSING PRICES 1963–78

	Median family income ¹	Median sales price of new homes ²	(Ratio) Sales price to income (new)
1963.....	\$6,249	\$18,000	2.9
1964.....	6,569	18,900	2.9
1965.....	6,957	20,000	2.9
1966.....	7,532	21,400	2.8
1967.....	7,933	22,700	2.9
1968.....	8,632	24,700	2.9
1969.....	9,433	25,600	2.7
1970.....	9,867	23,400	2.4
1971.....	10,285	25,200	2.5
1972.....	11,117	27,600	2.5
1973.....	12,051	32,500	2.7
1974.....	12,904	35,900	2.8
1975.....	13,719	39,300	2.9
1976.....	14,958	44,200	3.0
1977.....	16,009	48,800	3.0
1978.....	17,300	55,700	3.2
1979 ³	18,500	463,000	3.4

¹ Economic Report of the President, 1978, table B–25.

² Bureau of the Census, Department of Commerce, new 1-family houses sold and for sale, Construction Report C–25 for selected years.

³ Estimate.

⁴ 8-mo average.

TABLE 3.—ESTIMATES OF CIVILIAN POPULATION AND THE NUMBER OF HOUSEHOLDS BY AGE GROUP, SELECTED YEARS

	Civilian population ¹	House- holds ²	Headship rate ³	Civilian population ¹	House- holds ⁴	Headship rate ³
Under 25.....	92,899	5,857	0.063	91,187	6,220	0.068
25 to 34.....	29,159	14,331	.491	33,285	16,831	.506
35 to 44.....	22,514	11,703	.520	24,095	12,969	.538
45 to 54.....	23,779	12,939	.544	23,144	12,602	.545
55 to 64.....	19,497	11,149	.572	20,677	12,183	.590
65 and over.....	21,833	13,878	.636	24,054	15,225	.633
Total.....	209,681	69,857		216,442	76,030	

¹ U.S. Bureau of the Census, Current Population Reports, p. 25, No. 721, "Estimates of the Population of the United States, by Age, Sex, and Race: 1970-77," U.S. Government Printing Office, Washington, D.C. 1978.

² U.S. Bureau of the Census, Current Population Reports, p. 20, No. 296, "Projections of the Number of Households and Families: 1975-90," U.S. Government Printing Office, Washington, D.C. 1975.

³ The headship rate is obtained by dividing population into the number of households. (Population as of July 1, and the number of households as of Mar. 1).

⁴ U.S. Bureau of the Census, Current Population Reports, p. 60, No. 117, "Money Income in 1977 of Households in the United States," U.S. Government Printing Office, Washington, D.C. 1978.

CLOTHING AND TEXTILES: SUPPLIES, PRICES, AND OUTLOOK FOR 1980 ¹

(By Joan C. Courtless, home economist, Science and Education Administration,
U.S. Department of Agriculture)

CLOTHING EXPENDITURES AND PRICES

Consumer spending

Annual spending for clothing and shoes averaged \$441 per person according to preliminary figures for the first three quarters of 1979—up 5.8 percent over 1978 (table 1). Of this increase 62 percent was attributable to price increases and 38 percent was a real increase in spending. The real increase, however, was considerably less than a year earlier when 62 percent of the increase in per person spending was due to increased buying:

Year	Increase in spending per capita over previous year		Percent of increase attributed to—	
	Constant dollars	Current dollars	Real buying	Increased prices
1975	9	20	45	55
1976	10	24	42	58
1977	10	25	40	60
1978	25	40	62	38
1979	9	24	38	62

This slowdown in real spending may reflect continuing pressures on the family pocketbook from inflation, increased social security taxes, and higher income taxes caused by cost-of-living wage increases that have pushed families into higher tax brackets.

Retail sales

The slowdown in real spending is also reflected in retail sales which, when adjusted for inflation, have been declining since the end of 1978. The large amount of consumer spending late in 1978, in anticipation of higher prices, together with a heavy level of consumer debt, and the effects of the energy situation made buying patterns sluggish. During the summer, trade papers reported, "Women have no time for shop-

¹Information in this paper is based on reports available during the period January through October 1979. Discussion of business trends based on trade reports or news items in the Daily News Record, the Wall Street Journal, the Washington Post, the Baltimore Sun, Business Week, and Knitting Times. Other sources include Textile Organon L(9), September 1979; U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Cotton and Wool Situation, CWS-18 and CWS-20 (1979); U.S. Department of Commerce, Bureau of the Census, Current Population Report, P-25 (812), September 1979; U.S. Department of Labor, Bureau of Labor Statistics, News (Consumer Price Index monthly reports).

ping—they're waiting in gas lines." People shopped around by telephone rather than by car. With the 78° ruling, enclosed malls and stores became humid and muggy and discouraged both browsing and buying.

Anticipating winter 1979-80 and the 65° mandate, stores stocked up on sweaters and three-piece suits. Spring 1980 merchandise will include a higher percentage of short-sleeved shirts and two-piece suits.

Selling well in 1979, according to trade papers, were—

Sportswear—the gasoline shortage kept people closer to home.

Spectatorwear (cross between sportswear and loungewear)—for increased leisure time, comfort, and multipurpose use.

Quality and versatility instead of high style—buying fewer, well-made clothes that can be worn several ways and last a long time are bargains in the long run. Sportscoats, separates, dark colors, traditional silhouettes, and clothes made of 100 percent wool or cotton were in demand.

Consumer prices

Prices in 1979 for apparel and footwear, as measured by the Consumer Price Index (CPI), increased 4.2 percent over 1978. This increase was less than the 10.9 percent increase for the all items category of the CPI (table 2).

This relatively modest gain in prices contrasts with the "considerable increases" that consumers say they are seeing in clothing prices. It may be explained in part by the nature of the CPI. The CPI measures the change in cost over time of a fixed market basket of goods and services. The content of the market basket is kept unchanged as much as possible. Items are selected based on data collected in the consumer expenditure surveys of the Bureau of Labor Statistics—the last of which was 1972-73. The CPI does not reflect immediately changes in expenditure patterns nor adjust to new goods and services. Choices in clothing made by consumers are particularly sensitive to changes in fashion, and "high style" merchandise—often commanding premium prices—is not necessarily included in the CPI. Also, even though the original ticket prices of garments may be higher than those of comparable items previously available, retail practices such as discount pricing and earlier markdowns mean that a decreased proportion of consumer clothing purchases are at the originally marked price. The CPI takes into account the price at which a garment is offered for sale.

Within the overall CPI category of clothing and footwear, men's furnishings; boys' coats, jackets, sweaters and shirts; boys' furnishings; jewelry and luggage; and footwear increased relatively more than other clothing items between September 1978 and September 1979 (table 3).

SUPPLIES OF RAW MATERIALS

U.S. mill use of total fibers in 1979 (based on data for the first 9 months) is estimated to be 58.8 pounds per capita. This includes 13.8 pounds of cotton, 0.5 pound of wool, and 44.5 pounds of manmade fibers. This compares with 1978 per capita use of 56.7 pounds, including 13.9 pounds of cotton, 0.5 pound of wool and 42.3 pounds of manmade fibers.

Cotton

The 1979 cotton crop is expected to be about 13.7 million bales, 26 percent more than last year's. The price of cotton has been relatively stable and is becoming more competitive with polyester; by 1985 any price advantage polyester has enjoyed over cotton since its introduction probably will disappear. This is due in part to the rising price of crude oil. It is estimated that for each rise of \$1 in the price of a barrel of crude oil, the cost of producing 1 pound of polyester increases \$0.01, and the cost of producing 1 pound of cotton increases \$0.007. So far this year prices of manmade fibers have been raised three times.

Whereas 10 years ago cotton was considered "outdated," today's consumer appreciates the comfort-enhancing advantages of cotton and regard it as desirable enough to be a trendsetter. The 100-percent cotton durable-press shirts are selling extremely well at \$2 more than the 65-percent polyester, 35-percent cotton blend. At least five manufacturers are increasing production of these shirts. Cotton is also being used as a year-round sweater fiber.

A major concern of scientists in agriculture and the cotton industry is the health hazard associated with the processing of cotton. During the coming year, the National Academy of Sciences' National Research Council, in a study funded by the U.S. Department of Agriculture, will investigate the causes of byssinosis, or "brown lung." This disease affects the breathing capacity of some persons who handle cotton and other fiber crops, and is presumably caused by one or more parts of the dust that workers breathe on the job. As yet, the causative agent has not been identified. Meanwhile the problem is being attacked from several different directions:

Cotton breeders are devising methods of lowering cotton dust through genetic changes in the plant itself, and other scientists are looking at entirely new ways to harvest and gin cotton to reduce dust and preclude contamination.

Improving engineering controls for the capture and removal of respirable dust through air-handling systems and in the working atmosphere of textile plants.

Spraying minute amounts of mineral oil on the cotton during early processing steps to reduce dust generation.

Removing the causative agent by water washing or chemical deactivation of raw cotton.

Substituting rayon and polyester for cotton in blended yarns and fabrics.

Ways of producing yarn without twisting have been studied both in the United States and in Europe. Inserting twist is the highest cost factor in yarn production. When a no-twist method is used, productivity (amount of yarn produced in a specified time period) is vastly increased and costs are lowered. Also, knitted tubular fabrics made of a no-twist yarn will not twist out of square during wet finishing processes or when washed. Scientists at USDA's Southern Regional Research Center have developed a new method for producing a no-twist cotton yarn which could become commercially feasible in the future.

Wool

U.S. wool production in 1979 is estimated at 1 percent below 1978 and 6 percent below 1977. Woolgrowers plan a 50-percent increase in wool production in the next 10 years to meet anticipated increased consumer demand for both wool and lamb. U.S. farm prices for wool in 1979 were about 10 cents per pound higher than in 1978.

World wool prices are greatly influenced by the Australian Wool Corp. (AWC). The AWC attempts to stabilize prices in the Australian wool market by stockpiling wool when prices decline and placing these wools on the market to increase supply as prices go up. Australian wool prices have been increasing this fall, and the AWC has reduced its wool stock by over 80 percent (800,000 bales) from its October 1978 level.

Manmade fibers

Shipments of manmade fibers by U.S. producers during the first 8 months of 1979 were 11 percent above a year earlier. Manmade fiber domestic shipments for each of the first two quarters of 1979 were at record high levels, exceeding 1 billion pounds for the first time. Nylon and polyester constituted 75 percent of the total domestic shipments.

According to trade reports, growing world affluence will increase world textile consumption. Because of the need for land to grow food and the many costly processing steps in producing spun (natural) yarns, manmade yarns are expected to supply most of this increase. New manufacturing techniques could be used to introduce texture to filament yarns, thereby improving appearance and increasing the comfort factor.

Silk

Imports of raw silk for the first 8 months of 1979 were 22 percent higher than the 1978 level for the same time period; deliveries to U.S. mills were up almost 37 percent. Silk fiber prices have risen 17 percent since August 1978. China has scheduled a price increase for silk fibers of 6 percent to take effect in January 1980; however, no increased price in Chinese silk fabrics has been announced. U.S. fabric manufacturers, according to trade reports, will have to raise prices. Nevertheless, a growing demand for pure silk and silk/wool blends as part of the trend toward natural fibers is predicted.

Hides and leather

U.S. production of hides in 1979 will probably be less than in 1978 as 5 million fewer cattle go to market. Hide prices have more than doubled in the last 18 months. The price of leather in 1979 is estimated to be between 32 and 35 percent higher than in 1978. About 56 percent of shoe material is leather; the rest is vinyl and plastic, the cost of which has also risen due to oil price increases.

U.S. shoe production for 1979 is estimated at 390 to 395 million pairs, down from 419 in 1978. According to industry sources, the wholesale price of shoes has risen 25 percent in 1979; also, the producer price index for footwear was up 22 percent this September over a year ago. However, this has not all been passed on to the consumer and has not been reflected in the Consumer Price Index. Continued

price increases in footwear at the retail level can be expected during 1980.

Without a quota on hide exports, the percentage for domestic use has declined from 52 percent in 1972, to 38 percent in 1978, and to 27 percent for the first 7 months of 1979. The United States produces about 15 percent of the world's hides; it supplies 75 percent of the internationally traded hides.

On October 1, 1979, Argentina lifted its embargo on cattlehide exports in exchange for a phaseout in U.S. leather import tariffs. The embargo will be replaced by a temporary export tax. Both tariff and export tax will be eliminated on October 1, 1981, after intermediate reductions, if both nations agree. This should ease current hide shortages, and prices should increase at a slower rate.

DEVELOPMENTS IN THE EXPORTING AND IMPORTING OF FIBERS, FABRICS, AND APPAREL

U.S. exports of manmade fibers were up 64 percent for the first 6 months of 1979 over that period in 1978. U.S. prices are lower than those of other nations due to more efficient production, currency exchange rates, and the artificial control of U.S. oil prices. Exports of fabrics increased in 1979; imports decreased.

A substantial decline in overall U.S. imports of apparel was recorded. For the first 6 months of 1979, manmade fiber apparel imports dropped almost 11 percent; wool apparel, 22 percent; and cotton, 7 percent from the same period in 1978. This, together with a lower level of domestic production, was probably due to slower retail sales.

After 5 years of multilateral negotiations, the United States and 40 other nations, on April 12, 1979, entered into agreements designed to regulate and promote freer trade. When implemented, the Multinational Trade Agreement (MTA) removed export subsidies, import restrictions, and permitted tariff reductions. Tariff cuts of 40 to 60 percent on women's and children's clothing have been widely reported. Eventually, this will mean lower retail prices for imported apparel.

Various Government agencies are concerned with the effects of imports on our domestic industries and employment levels. When petitioned by a firm, the U.S. Department of Commerce will investigate whether increased imports have led to decreased sales or to "layoffs" of workers. If certified as eligible to receive trade adjustment assistance, firms can receive financial and/or technical assistance. Since the program began in 1975, over 250 firms in the footwear, apparel, and textile industries have been certified eligible for assistance. The International Trade Commission hears complaints from U.S. leather apparel firms and their workers that increased imports are causing serious injury to the domestic industry. The U.S. Department of Labor has certified that some 2,000 workers were "laid off" in 1978 as a result of increased import competition, and are eligible to apply for Federal funds under its trade adjustment assistance program. Congress is considering establishing a new special court of international trade to review import transactions.

REGULATORY DEVELOPMENTS

Federal law prohibits unfair acts and practices and unfair methods of competition. The Federal Trade Commission has been conducting

wide-ranging investigations of price fixing in the men's and women's apparel industries. When violations of the law are exposed, consent order settlements with the manufacturer prohibit them from fixing the retail price at which their product can be sold or advertised.

A new type of label telling consumers more specifically how to care for textile garments and piece goods, and how to avoid damaging them, will be required under a new Federal Trade Commission ruling. It will amend the 1972 requirement for permanent care labeling of textile wearing apparel and will add draperies and curtains, upholstered furniture and slipcovers, carpets and rugs, household linens, and suede and leather garments. New provisions include:

Manufacturers recommending washing on a care label must also recommend the method—hand or machine—and the water temperature—unless all temperatures can safely be used.

Method of drying and, where necessary, the temperature must be given.

Items that need ironing and cannot be ironed with a hot iron must have care labels stating the recommended temperature.

Appropriate warnings, such as "no bleach," must be included.

Manufacturers recommending drycleaning must also recommend the type of solvent—unless all solvent can safely be used.

If an item can be cleaned by more than one method, the manufacturer need give instructions for only one.

Manufacturer should have a "reasonable basis" for the recommendations, on the care label.

Care labels for piece goods must be given upon request by the consumer.

The new label will go into effect in spring 1980.

TABLE 1.—ANNUAL EXPENDITURES ON CLOTHING AND SHOES¹

Year	Per capita expenditures ²		Percent of expenditures for personal consumption		Aggregate expenditures	
	Constant dollars (1972)	Current dollars	Constant dollars (1972)	Current dollars	Billions of constant dollars (1972)	Billions of current dollars
1960	203	148	8.1	8.2	36.6	26.7
1961	203	149	8.1	8.2	37.3	27.4
1962	209	154	8.1	8.1	38.9	28.7
1963	209	156	7.9	7.9	39.6	29.5
1964	222	166	8.1	8.0	42.6	31.9
1965	227	172	7.9	7.8	44.2	33.5
1966	239	186	8.0	7.9	46.9	36.6
1967	236	192	7.8	7.8	46.9	38.2
1968	242	208	7.7	7.8	48.6	41.8
1969	245	223	7.6	7.8	49.6	45.1
1970	240	227	7.4	7.5	49.2	46.6
1971	249	244	7.5	7.6	51.6	50.5
1972	264	264	7.5	7.5	55.1	55.1
1973	281	291	7.7	7.6	53.2	61.3
1974	279	308	7.8	7.3	59.1	65.3
1975	288	328	7.9	7.2	61.4	70.1
1976	298	352	7.8	6.9	64.2	75.7
1977	308	377	7.8	6.8	67.4	82.4
1978	333	417	8.1	6.8	72.7	91.2
1979 ³	342	441	8.2	6.6	75.5	97.2

¹ Includes yard goods, but excludes services such as cleaning and repairing clothing and shoes.

² Calculated by dividing aggregate expenditures for each year by population figures for July of each year.

³ Preliminary figures—average of estimates for 1st 3 quarters of 1979 (i.e., seasonally adjusted quarterly totals at annual rates).

Sources: U.S. Department of Commerce, Bureau of the Census. 1979, population estimates and projections, Current Population Reports, series P-25, No. 812. U.S. Department of Commerce, Bureau of Economic Analysis, 1978, Survey of Current Business (table 11) 59(7): 19, and personal communication with the Bureau of Economic Analysis.

TABLE 2.—ANNUAL PERCENTAGE CHANGE IN SELECTED INDEXES OF CONSUMER PRICES

Consumer Price Index	1975	1976	1977	1978	1979 ¹
All items.....	+9.1	+5.8	+6.5	+7.6	+10.9
Apparel and upkeep.....	+4.5	+3.7	+4.2	+3.4	+4.2
Men's and boy's clothing.....	+4.3	+3.5	+4.6	+2.3	+2.3
Women's and girl's clothing.....	+2.4	+2.8	+3.2	+1.8	+1.8
Footwear.....	+4.4	+4.0	+4.7	+4.0	+7.7
Other apparel commodities ²			+4.6	-.1	+6.6
Infants' and toddlers' ³					+2.9

¹ Preliminary estimates—average for 1st 3 quarters of 1979 compared—with the average for 1st 3 quarters of 1978.

² Developed in 1976. Includes sewing materials and notions, jewelry, and luggage.

³ Developed in 1978.

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1979, News, Consumers Price Index (monthly issues); and personal communication with the Bureau of Labor Statistics.

TABLE 3.—PERCENTAGE CHANGE IN SELECTED INDEX OF CONSUMER PRICES FROM SEPTEMBER 1978 TO SEPTEMBER 1979

Consumer Price Index	Percentage change
All items.....	+12.4
Apparel and upkeep.....	+1.6
Men's and boys' clothing.....	+2.4
Men's:	
Suits, sport coats, and jackets.....	-1.4
Coats and jackets.....	-2.7
Furnishings and special clothing.....	+6.3
Shirts.....	+4.7
Dungarees, jeans, and trousers.....	+1.1
Boys':	
Coats, jackets, sweaters, and shirts.....	+6.2
Furnishings.....	+7.5
Suits, trousers, sport coats, and jackets.....	+2.2
Women's and girls' clothing.....	+1.5
Women's:	
Coats and jackets.....	+1.5
Dresses.....	-1.3
Separates and sportswear.....	+0.5
Underwear, nightwear, and hosiery.....	+4.5
Suits.....	+2.2
Girls':	
Coats, jackets, dresses, and suits.....	+0.1
Separates and sportswear.....	+1.1
Underwear, nightwear, hosiery, and accessories.....	+3.0
Infants' and toddlers'.....	+3.8
Other apparel commodities.....	+7.9
Sewing materials and notions.....	+2.8
Jewelry and luggage.....	+10.0
Footwear.....	+8.9
Men's.....	+10.8
Boys' and girls'.....	+9.2
Women's.....	+7.1

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1978, CPI Detailed Report September 1978; and personal communication with the Bureau of Labor Statistics.

ACCESSIBILITY OF PASSENGER TRANSPORTATION FACILITIES IN RURAL AREAS OF THE UNITED STATES

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The objective of the research program was to inventory transportation facilities available to passengers in agricultural counties where 35 percent or more of the population was classified as "rural farm or non-farm." This review of the accessibility of rural residents to passenger transportation modes is provided by a growing national concern over the economic survival of rural communities in the face of threatened or actual abandonment of rail stops, air carrier routes, and intercity bus pickup points. In an era of mounting gasoline shortage, it may no longer be possible to solve all rural transportation needs with the private automobile. If this is the case, continued reliance on automobiles as the sole means of transportation in rural areas may cause problems not only for those rural areas, but for urban concentrations which compete for the same energy resources.

As witness to the growing interests in the relationship of agriculture and transportation, the rural transportation advisory task force has conducted a series of public hearings about agricultural transportation problems and suggested ways of solving those problems. It is the purpose of this report to consider whether those problems spill over into passenger transportation areas, as well as freight service. Personal mobility of agriculture affects the ability of rural areas to survive economically in the decade ahead.

This report on rural passenger transportation is designed to bring answers to a number of questions relating to passenger mobility in predominantly agricultural counties. These questions are:

1. How much more serious is the problem of passenger immobility in the lowest income counties than in "average" counties?
2. How many rural counties are presently served by passenger rail service?
3. How many rural counties are presently served by intercity bus service?
4. How many rural counties contain an airport served by commercial common carrier service?
5. How far does a person have to drive from the county seat, or other population centers within the county to reach a bus, rail or air terminal? Has this pattern changed in the last 10 years?
6. How have the numbers of facilities changed in the last 10 years? Where is the problem of abandonment most severe?

7. Which types of rural communities have been most likely to lose passenger service? Regional and income differences will be explored at this point.

8. Have social service agency transportation programs provided alternative mobility opportunities in these areas?

9. How many of the sample counties are served by section 147 programs?

10. What is the relationship between percentage below poverty in a county and car ownership distributions, and accessibility measures as listed above?

METHODOLOGY

The research project identified 192 counties using data from the Office of Transportation, U.S. Department of Agriculture, and from the U.S. Census. Rural counties were defined as those with 35 percent or more of the population designated as "rural farm." Appendix A lists the counties defined.

To obtain accessibility measures, researchers conducted telephone discussions with county officials in the county seats of each of the counties. A guide for these telephone discussions is included as appendix B. In addition data were gathered from the modal organizations concerned with rail, air, and intercity bus transportation. Transportation manuals and passenger schedule guides were used to determine location of facilities. Distance measures were derived from the telephone interviews. Other characteristics of the counties were derived from the International City Management Association "The County Year Book," 1976, Washington, D.C. In addition, U.S. Census information from the "Social and Economic Characteristics of the U.S. Population," 1970 was gathered by county.

Of the 192 originally identified counties with populations 35 percent or more in agriculture as of 1970, complete information was obtained on 182 for a response rate of 94.7 percent. Partial information was obtained on 189 counties, and the computer runs were done on this number of cases, with missing values so designated. Telephone interviews yielded most information requested, as the local officials (judges, county commissioners, county administrators, etc.) were usually quite well informed about local facilities. Estimates of service availability in other counties was less accurate, and cross-checks were made with transportation manuals and other sources.

CHARACTERISTICS OF THE SAMPLE COUNTIES STUDIED

From table 1, one notes that the agricultural counties studied are quite homogeneous, with an average population of 4,726, a population density of 3.8 persons per square mile, and an average of 712 persons employed in agriculture as of 1970. The standard errors attached to the county means suggests the similarity of the counties, and table 1 also provides the range of values identified.

These counties show a median income of \$6,718 with a range from \$1,512 to \$39,560, for 1970. Median education levels are high: an average of 11.12 years with one county registering a median education of 16.1. On average 18.2 percent of the families in these counties live at or below the poverty line, with a range from 2.7 percent to 49.3 percent. It should be noted that the definition of rural used in this study focuses

on agricultural employment as a percentage of the whole, and thus eliminates many low-income rural counties such as those in the rural South. The majority of the counties are found in the Midwest. Table 2 gives the regional distribution of sample counties. A subsequent study will be conducted to examine accessibility patterns in the lowest income rural counties, a sample expected to vary considerably from the one reported on in this study.

POSSIBLE REPORTING BIASES

Respondents for the most part were county officials without immediate personal knowledge of the travel patterns of the transportation deprived in their areas. For the most part they were knowledgeable about transportation facilities currently available, but data on 1970 facilities may be inaccurate. This information has not been cross-checked with manuals.

FINDINGS

1. Total absence of passenger transportation facilities in the majority of rural counties

Of the counties surveyed, only 2 percent had a rail passenger terminal or stop; only 4 percent of the counties contained an airport offering commercial common carrier air service (commuter or other); and only 43 percent of the sample counties had a pickup point for intercity bus. Since the base of accessibility is low throughout the sample, it is difficult to make comparisons about degree of accessibility of rail or air service.

2. The average rural resident travels more than 50 miles to get to the nearest rail or air facility

The nearest rail stop was on average 85 miles away from the county seat. Thus an auto trip of more than 1½ hours is required to take the train. The average commercial airline is 67 miles from the county seat, requiring a drive of 1 hour and 20 minutes. The most accessible mode is the intercity bus, located at an average distance of 23 miles from the county seat, and requiring a drive of nearly half an hour. These averages obscure the fact that the range of distance traveled varies greatly; some counties are located more than 300 to 500 miles from the nearest passenger transportation facility.

3. Many existing facilities are threatened with abandonment

In three counties, plans were underway to abandon the intercity bus service presently in operation. In several other counties, schedules are being reduced seriously. Rail service abandonment is scheduled in approximately one-quarter of the counties where rail service was considered "accessible" (5 cases out of 21). In 1970, 11 counties had commercial common carrier service; now only 8 have this service out of the sample of 189.

4. The majority of rural counties have some form of social-service based passenger transportation services for special groups (elderly, handicapped, low income, et cetera)

Sixty-five percent of the counties reported some form of specialized transportation services available for target groups such as the elderly

and handicapped. From table 5, one notes that the availability of such services is related positively to the degree of transit deprivation, and is an indication of public concern to attack the problems of the carless population in rural areas. Nevertheless, more than a quarter of the counties with the highest levels of transit deprivation (15 percent or greater) have no form of social service transportation at all.

5. The majority of the carless in rural areas are dependent upon transportation services provided by auto-driving friends and relatives

Respondents were asked how the carless traveled in cases where rural accessibility to public passenger transportation is restricted. The pattern of responses showed that ride-sharing was the dominant transportation mode. Other novel answers were suggested however: Riding horseback, catching a ride with the mailman or sheriff's department, paying a neighbor to ride into the nearest urban area, hitchhiking, and using horse and buggy!

TABLE 1.—CHARACTERISTICS OF THE SAMPLE RURAL COUNTIES, 1979

Item	Mean	Standard error	Low	High
1. County population.....	4,726.0	226.0	487.0	14,889.0
2. Percentage rural farm population.....	43.8	1.0		82.6
3. Number of persons employed in agriculture, 1970.....	712.0	52.0	29.0	8,560.0
4. Percentage of county labor force unemployed.....	2.9	.1	.3	15.6
5. Median income.....	6,718.0	195.0	1,512.0	39,560.0
6. Families in county.....	1,246.0	60.0	32.0	3,825.0
7. Percentage of families with incomes below poverty.....	18.2	.5	2.7	49.3
8. Percentage of county population aged 65 and over.....	14.1	.8		
9. Median education.....	11.2	.1	5.5	16.1
10. Net migration decade.....	-2.9	.8	-53.0	55.8
11. Percentage transit deprived.....	11.4	.3	1.4	31.1
12. Percentage transit handicapped.....	73.2	.8	.8	95.6
13. Autos registered in 1970.....	2,252.0	127.4	181.0	8,820.0
14. Autos registered in 1977.....	3,109.0	562.0	177.0	9,430.0
15. Miles to nearest intercity bus stop.....	23.0	3.0	0	304.0
16. Miles to nearest passenger train stop.....	85.0	6.0	0	500.0
17. Miles to nearest airport served by common carrier airline.....	67.0	4.0	0	400.0
18. Minutes to nearest intercity bus stop.....	28.0	4.0	0	400.0
19. Minutes to nearest passenger rail.....	101.0	8.0	0	800.0
20. Minutes to nearest airport served by common carrier airline.....	83.0	6.0	0	751.0
21. Miles to nearest taxi service.....	56.0	4.0	6.0	(¹)
22. Measured miles to nearest airport.....	63.0	4.0	5.0	550.0
23. Accessibility score, scale of 1 to 40.....	19.0	.3	0	29.2

¹ Not available.

TABLE 2.—DISTRIBUTION OF COUNTIES BY FEDERAL REGION

	Number	Percent
Federal region:		
4.....	4	2.2
5.....	3	1.6
6.....	27	14.8
7.....	58	31.9
8.....	81	44.5
9.....	1	.5
10.....	0	0
Total.....	182	100.0

TABLE 3.—SELECTED MEASURES OF CHANGES IN ACCESSIBILITY OF PASSENGER TRANSPORTATION IN RURAL AREAS, 1970-79

Item	Number in sample counties, 1970		Number in sample counties, 1979	
	Number	Percent	Number	Percent
1. Accessible bus service intercity.....	83	43.9	88	46.6
2. Rail service accessible (passenger).....	22	11.6	21	11.1
3. Airport in county or nearby gives common carrier air service.....	11	5.8	8	4.2
4. Airstrip or other landing facility in county.....	87	46.0	87	46.0
5. Charter service.....	(1)	-----	20	-----
6. Plans to discontinue bus service in county.....	(1)	-----	3	-----
7. Plans to abandon rail service in county.....	(1)	-----	5	-----
8. Plans to build air facility.....	(1)	-----	2	-----

¹ Not available.

TABLE 4.—COMPARISON OF HIGHEST AND LOWEST INCOME RURAL COUNTIES

Item	Highest income ¹	Lowest income ²	Total sample ³
Percentage with bus stop in county.....	29	33	43
Percentage with bus terminal in county.....	0	6	3
Percentage with rail stop or terminal.....	0	0	2
Percentage with airport served by commercial common carrier airline.....	3	6	4
Percentage with airstrip or airport in county.....	47	49	49
Percentage with charter service.....	11	6	11
Percentage with some form of intercity bus.....	33	47	43
Percentage with social service-based transportation.....	60	63	65
Percentage with other non-profit transportation.....	13	7	14
Percentage with airstrip only.....	16	21	14
Percentage having to go to another State for rail service.....	13	30	20
Percentage having to go to another State for commercial common carrier air service.....	5	9	7

¹ Median income of "highest group" is "over \$7,500".² Median income of "lowest group" is "under \$5,000".³ Total sample was divided into tertiles, high, medium, and low.

TABLE 5.—DISTRIBUTION OF SOCIAL SERVICE TRANSPORTATION BY DEGREE OF TRANSPORTATION DEPRIVATION

	Measured transportation deprivation ¹		
	Low	Medium	High
Counties with service:			
Number.....	56	44	20
Percent of total.....	68.3	59.5	74.1
Counties without service:			
Number.....	26	30	7
Percent of total.....	31.7	40.5	25.9
Total:			
Number.....	82	74	27
Percent.....	100.0	100.0	100.0

¹ Transit deprivation is measured in terms of the percentage of county families with no automobile. "Low" counties are those where the percentage is nine or more. "Medium" counties show a percentage 10 to 14. "High" counties are those where the percentage is 15 or greater.

APPENDIX A.—SAMPLE COUNTIES WITH PERCENTAGE TRANSPORTATION DEPRIVED AND HANDICAPPED

State and County	Percentage deprived	Percentage handicapped
Colorado:		
Cheyenne	8.2	79.7
Custer	4.6	56.3
Elbert	10.2	57.6
Kiowa	6.6	81.2
Saguache	17.2	77.0
Washington	11.3	72.0
Yuma	9.7	72.8
Florida:		
Glades	11.7	70.7
Hardee	15.6	66.7
Georgia: Baker	18.7	76.8
Idaho:		
Camas	2.4	45.5
Clark	5.3	52.9
Gooding	10.1	70.8
Lincoln	8.9	76.3
Oneida	6.8	79.1
Ouyhee	17.7	78.1
Teton	9.4	81.7
Iowa:		
Adair	10.5	75.1
Lyon	7.4	66.7
Ringgold	10.5	80.4
Taylor	13.2	76.9
Kansas:		
Chase	14.2	70.0
Cheyenne	11.0	78.6
Gcuc	4.6	60.3
Greeley	4.0	67.5
Haskell	9.7	75.8
Hodgeman	4.1	69.7
Jewell	9.9	69.0
Lane	5.0	74.7
Raulins	8.7	70.6
Sheridan	8.1	73.8
Stanton	8.0	74.6
Wallace	9.1	73.8
Wichita	4.1	70.0
Kentucky:		
Metcalfe	17.1	62.8
Robertson	14.4	74.6
Minnesota:		
Lincoln	9.7	74.8
Murray	8.0	67.2
Norman	11.6	72.3
Mississippi: Issaquena	31.1	69.8
Missouri:		
Knox	16.6	79.3
Mercer	18.6	84.9
Scotland	16.0	79.4
Montana:		
Carter	20.2	88.8
Chouteau	9.2	63.4
Daniels	17.2	77.6
Garfield	23.4	81.3
Golden Valley	15.8	78.0
Judith Basin	11.8	77.4
Liberty	9.1	76.2
McCone	9.3	70.5
Madison	12.2	
Meagher	24.1	
Phillips	12.7	
Powder River	13.0	
Prairie	16.2	
Teton	12.7	
Treasure	12.1	
Wibaux	8.5	
Nebraska:		
Antelope	11.2	
Arthur	14.4	
Banner	3.4	
Blaine	1.9	
Boone	9.8	
Boyd	10.3	
Cedar	10.0	
Chase	12.2	
Cherry	7.5	
Cumming	9.8	
Custer	13.0	
Dundy	7.7	
Fillmore	13.1	

APPENDIX A.—SAMPLE COUNTIES WITH PERCENTAGE TRANSPORTATION DEPRIVED AND HANDICAPPED—Continued

State and County	Percentage deprived	Percentage handicapped
Nebraska—Continued		
Frontier.....	7.5	-----
Garden.....	14.6	-----
Gosper.....	10.1	-----
Grant.....	8.9	-----
Greeley.....	12.1	-----
Hayes.....	17.3	-----
Hitchcock.....	10.9	79.3
Holt.....	13.3	73.1
Howard.....	10.7	70.7
Keya Paha.....	14.6	87.6
Knox.....	19.5	79.8
Logan.....	19.5	79.8
Loup.....	7.5	72.8
McPherson.....	13.6	94.8
Pawnee.....	14.6	76.5
Perkins.....	6.5	69.5
Pierce.....	9.2	74.3
Rock.....	12.4	64.8
Sherman.....	13.7	78.9
Stanton.....	9.0	69.5
Valley.....	12.7	75.3
Wheeler.....	7.0	72.9
North Dakota:		
Benson.....	15.3	79.7
Billings.....	9.3	82.3
Cavalier.....	9.5	74.4
Dickey.....	9.0	73.5
Divide.....	13.2	78.6
Dunn.....	7.5	74.2
Eddy.....	12.1	86.9
Emmons.....	8.8	74.5
Grant.....	4.8	79.4
Kidder.....	7.8	66.9
Hettinger.....	11.7	72.9
La Moure.....	9.5	72.5
Logan.....	12.2	76.8
McHenry.....	11.5	78.2
McIntosh.....	8.0	74.6
McKensie.....	9.0	80.5
Nelson.....	12.8	73.1
Oliver.....	6.9	74.1
Renville.....	8.5	80.0
Sargent.....	6.9	72.7
Sherman.....	9.8	68.9
Slope.....	11.2	72.1
Steele.....	5.3	78.5
Wells.....	10.7	72.0
Oklahoma:		
Cimmaron.....	9.6	64.6
Roger Mills.....	10.5	43.5
Oregon: Morrow.....	10.4	78.0
South Dakota:		
Aurora.....	9.0	73.1
Bennet.....	11.2	49.5
Buffalo.....	22.2	71.9
Campbell.....	6.4	76.4
Charles Mix.....	15.4	71.4
Clark.....	7.7	76.6
Carson.....	19.1	79.5
Devel.....	10.1	72.6
Douglas.....	12.8	74.5
Edmunds.....	11.7	73.9
Faulk.....	9.4	79.6
Gregory.....	14.3	75.8
Haakon.....	7.4	70.7
Hamlin.....	5.5	71.9
Hanson.....	11.4	79.4
Harding.....	16.7	80.0
Hutchinson.....	11.0	69.5
Hyde.....	11.1	76.8
Jerauld.....	14.5	83.8
Kingsbury.....	10.3	72.2
Lyman.....	11.0	77.5
McCook.....	9.1	73.2
McPherson.....	11.5	78.2
Marshall.....	8.9	74.7
Mellette.....	10.1	82.0
Miner.....	6.4	70.0
Moody.....	6.7	70.7
Perkins.....	13.6	75.1
Potter.....	11.9	73.9
Roberts.....	13.6	78.1

APPENDIX A.—SAMPLE COUNTIES WITH PERCENTAGE TRANSPORTATION DEPRIVED AND HANDICAPPED—Continued

State and County	Percentage deprived	Percentage handicapped
South Dakota—Continued		
Sanborn.....	12.8	76.4
Spink.....	9.8	74.5
Sully.....	9.7	71.8
Tripp.....	13.9	73.4
Turner.....	9.0	73.0
Washabaugh.....	16.9	60.0
Zeibach.....	17.5	73.5
Nevada: Eureka.....	28.0	91.9
Texas:		
Bailey.....	9.4	74.0
Borden.....	7.1	90.4
Briscoe.....	9.3	77.7
Castro.....	7.0	73.9
Cochran.....	11.2	70.3
Concho.....	8.1	64.1
Cottle.....	16.2	83.1
Crosby.....	11.3	67.9
Dickens.....	16.1	84.3
Edwards.....	19.8	81.1
Fisher.....	12.8	82.7
Floyd.....	9.7	70.3
Glasscock.....	7.6	84.4
Hartley.....	1.5	63.3
Kennedy.....	9.2	51.7
Kent.....	6.0	60.4
King.....	13.7	95.6
Kinney.....	29.3	72.6
Knox.....	17.7	86.2
Lynn.....	7.7	70.2
Mason.....	16.4	83.3
McMullen.....	12.5	60.2
Parmer.....	8.0	71.2
Roberts.....	10.3	88.0
Sherman.....	6.4	70.8
Stonewall.....	11.5	82.4

APPENDIX B

The U.S. Department of Agriculture, Office of Transportation has awarded the Transportation Institute of M.C. A&T State University a contract to inventory transportation facilities available to passengers in selected agriculture counties. Your county has been selected as one of the study counties. We would like to ask some questions about the past and current transportation facilities and service offered to this locality.

Thank-you for your cooperation.

QUESTIONNAIRE

Region Code _____ State _____ Code _____ County _____ Code _____
 Locality _____ Code _____ County Seat yes _____ no _____

1. Is there an intercity bus stop or station/terminal in your town. Yes _____ No _____

- a) stop
 b) station/terminal

2. How far is the nearest intercity bus:

stop _____ miles _____ time _____ or station/terminal _____ miles _____ time.

- a) intercity bus stop or station/terminal in another town but same county
 b) intercity bus stop or station/terminal in another county
 c) intercity bus stop or station/terminal in another state

3. Has the pattern of time and distance to the bus stop or station/terminal changed over the last ten years. (1970-1979)?

- a) less miles/less time
 b) more miles/more time
 c) no change
 d) other

1970	1979

4. How frequent is the bus service?

a bus every _____ minutes _____ pick-up(s) a day

5. How has the number and quality of facilities changed since 1970?

- a) did not have service in 1970, but does now
 b) have never had service/
 still have no service
 c) added new routes
 e) more stops
 f) less stops
 g) changed bus companies

Summary
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	1970	1979
5. (cont'd)		
h. built terminals vs stops		
i. have stops vs stops		
j. abandoned service		
k. less frequent service		
l. new service		
m. no change		
n. combination of 2 or more of the above*		

* Be sure to write all choices under the appropriate year, (n) is for computer use

6. Are there future plans to discontinue bus service? Yes _____ No _____

Why? a) low ridership
b) high operating cost
c) low revenue
d) other _____

7. Is your town served by a local bus system? Yes _____ No _____

a) local bus service privately owned
b) local bus service publicly owned

8. Is there passenger train service in your town? Yes _____ No _____

a) train station
b) train stop

9. How far is the nearest train station/stop? _____ miles _____ time (minutes)

a) stop or station in another town but in your county
b) stop or station in another county
c) stop or station in another state

10. Has the pattern of time and distance to the train station or stop changed over the last ten years?

	1970	1979
a) less miles/less time		
b) more miles/more time		
c) no change		
d) other		

11. How frequent is the train service? every _____ hours _____ minutes
_____ stops a day

Questionnaire
Page 3

12. How has the number and quality of the train facilities changed since 1970?

- a) new terminal/station
- b) new stops
- c) less frequent service
- d) more frequent service
- e) different line or carrier
- f) new service
- g) service did not exist in 1970, but does now
- h) service did not exist/still does not
- i) service does not exist presently, but did in 1970
- j) combination of 2 or more of the above answers*

* Be sure to write all choices under appropriate year, (j) is for computer use.

13. Are there future plans to discontinue passenger train service?

- Yes _____ No _____ Why?
- a) low ridership
 - b) high operating cost
 - c) low revenues
 - d) Amtrak
 - e) other _____

14. Is there an airport in this town served with commercial common carrier service? Yes _____ No _____

15. Is there an airport in this a) town Yes _____ No _____
b) county

16. What type of air service is available?

- a) charter service
- b) privately owned planes
- c) commuter service
- d) air strip

17. Is the airport facility:
- a) privately owned
 - b) publicly owned
 - c) in the process of being built
 - d) in the planning stage
 - e) abandoned
 - f) other _____

18. How far is the nearest airport served with commercial common carrier service? _____ miles _____ time

- a) in another town but in your county
- b) in another county
- c) in another state

Questionnaire

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19. Has the pattern of time and distance to the nearest airport served with commercial common carrier changed over the last ten years (since 1970)

a) less miles/less time	1970	1979
b) more miles/more time		
c) no change	miles	
d) other	minutes	
	other	

20. How frequent are the flights? every _____ minutes
_____ pick-up(s) a day.

21. How has the number and quality of the facilities changed since 1970?

a) new service	1970	1979
b) service abandoned		
c) did not have service		
d) less flights		
e) more carriers		
f) less carriers		
g) same service/different carriers		
h) added new routes		
i) dropped same routes		
j) new or longer landing strips		
k) expanded terminal		
l) no change		
m) combination of 2 or more*		

* Be sure to write all choices under the appropriate year, (m) is for computer use.

22. Are there future plans to discontinue air service? Yes _____ No _____

Why? a) low ridership
b) high operating cost
c) low revenues
d) other _____

23. Is there a taxi service in your town? Yes _____ No _____

a) How many taxis available? _____

24. Is there a taxi service:

a) based in another town but in this county
b) based in another county
c) based in another state

Questionnaire
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25. How far from this town must a taxicab travel to render service?

	1970	1979
miles		
town		

26. What is the fare by taxi to the nearest:

- a) airport with commercial common carrier service \$ _____
 b) bus stop/terminal \$ _____
 c) train stop or station/terminal \$ _____
 from your location.
 d) don't know _____

27. What means of transportation is utilized to reach bus, airports, and train stations/terminals or stops by persons who do not own automobiles?

	always		often	
	1970	1979	1970	1979
a) taxi				
b) friend/relative				
c) walk				
d) local official				
e) someone for hire				
f) other				

	seldom		never	
	1970	1979	1970	1979

28. How do you know or what do you base this information?

	1970	1979
a) survey		
b) visual impression		
c) experience		
d) other _____		

29. Is there a social service program in your town or county that provides alt mobility (transportation) ie. Dial-a-ride, mini-bus services for elderly and/or handicapped, hospital service, trips to the clinic, etc. Yes _____ No _____

List: Program What areas served?





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